AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

Entered as second-class matter at the postoffice, Dalton, Ga., under act of March 3, 1879.

Volume 85
Number Ten
$1.00 a Year.

AUGUST, 1921

Published monthly by
W. R. C. Smith Publishing Co.
Dalton, and Atlanta, Ga.

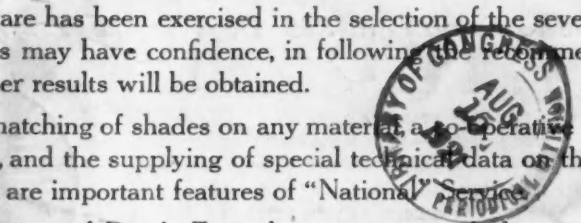
Dyer's Formulas for 1921 Fall Season Shades

DYERS of silk, cotton and wool will find of great practical value our booklet of Dyer's Formulas that has just come from the press. The recipes have been prepared by "National" research colorists for matching the shades in the 1921 Fall Season Shade Card, issued by the Textile Color Card Association.

Due care has been exercised in the selection of the several dyes' names, and dyers may have confidence, in following the recommendations made, that proper results will be obtained.

The matching of shades on any material, a co-operative effort in solving problems, and the supplying of special technical data on the application of dyestuffs, are important features of "National" Service.

This group of Dyer's Formulas serves a practical purpose and meets a present need. If you have not already received a copy, write to our nearest branch office and they will be glad to supply you.



National Aniline and Chemical Co., Inc.

21 Burling Slip, New York

Akron
Boston
Chicago
Hartford
Charlotte

THE FIRST AND LARGEST MAKERS of COAL-TAR DYES IN AMERICA

Montreal
Toronto
Providence
Philadelphia
San Francisco

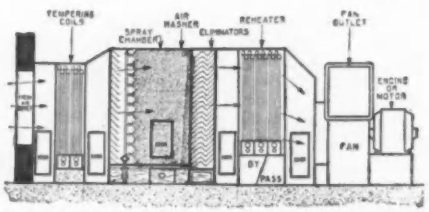
NATIONAL DYES

Table of Contents, page 29. Advertisers' Index, page 296. Buyers' Index, page 284

Sturtevant

AIR CONDITIONING SYSTEMS

Boost Efficiency in Textile Mills



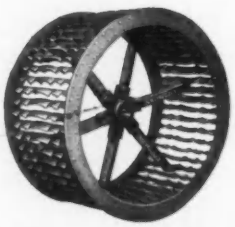
Typical Sturtevant Heating, Ventilating, and Air Conditioning System.

Unfavorable climatic conditions **inside** textile mills cause innumerable yarn breaks with their resultant delays and shutdowns. "Fly" or "Fluff" saturated atmospheres are detrimental to the health of employees and promote inefficiency. In each case efficiency is decreased all over the mill and **production suffers!** A "climate doctor" is needed!

Specify Your Ideal Climate and we will Guarantee to Furnish it 365 Days in the Year

REGARDLESS of *outside* weather our "climate doctors" and "air specialists" will make every day an *ideal day inside* your plant—for your material—your manufacturing process—and your employees. Countless industries are already successfully and economically operating Sturtevant Air Conditioning systems. In textile mills we get at the heart of yarn breaks by eliminating static electricity. We furnish a cool, dry climate in summer; warm moist climate in winter. Humidity and temperature are under easy control and can be regulated at will. Request our engineering department to study your plant and submit a plan and an estimate of your needs. No obligation incurred. Write the nearest of our twenty-three Sales Engineering Branches.

is the symbol of the W. L. Fleisher Co., engineering experts in the design and installation of Air-Conditioning Systems.



For greater strength and efficiency Sturtevant multivane fan wheels have patented cup shaped vanes which enable Sturtevant Multivane fans to deliver largest volumes of air at smallest cost.

B. F. STURTEVANT COMPANY

HYDE PARK BOSTON, MASS., AND ALL PRINCIPAL CITIES

Sturtevant

REG. U.S. PAT. OFF.

PUTS AIR TO WORK

MIRROR DROP WIRES

TRADE-MARK REG. U. S. PAT. OFF.

Having greatly improved the finish of our Northrop Loom Drop Wires we have adopted the trade-mark

MIRROR

to identify the drop wires of our manufacture and each shipment will contain a slip bearing this trade-mark.

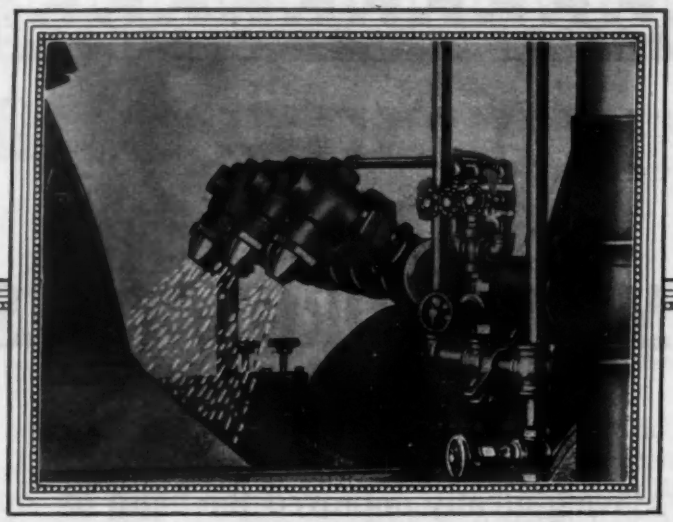
We request our Northrop Loom customers to look for this name which will guarantee the high quality of the drop wires.

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

ATLANTA GEORGIA

Copyright 1917 by Draper Corporation



TURBO SPRAYER

Turbo Devices for Special Purposes

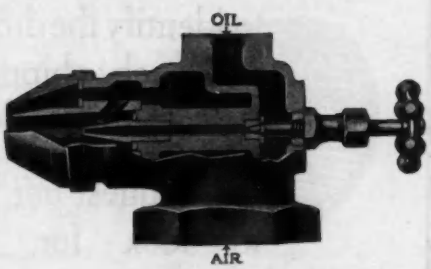
WOOLEN and WORSTED MANUFACTURERS particularly—
also cotton and jute manufacturers—use the Turbo Oil Sprayer.

It is used for conditioning wool on feed aprons of mixing pickers—or Fearnaught pickers. It is also used for introducing olive oil, or any other, whatever used—into dry wool after having been washed and dried.

An experienced woolen manufacturer after three years constant use writes:

"As a matter of fact, your oiler is so far ahead of any method we have ever used before, especially in its penetration of the oil into the very fibre of the wool, that many corollary forces are brought into play. A few of them are: saving of oil, of labor, of untidiness and of time in picking, less waste in carding and spinning, more uniform weight in Bramwell feed, better roping, stronger yarn, more production in every department, and most important of all, easier scouring of finished product.

"We recommend your oiler most highly."

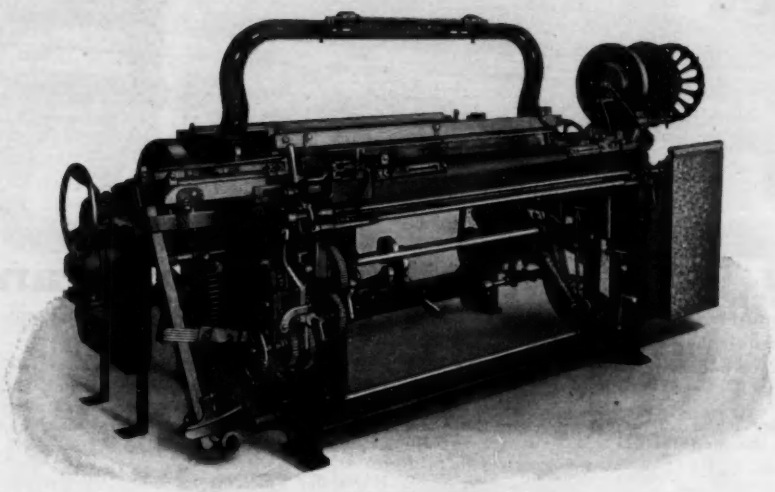


Head of Turbo Sprayer
(Sectional View)

The same equipment, adapted for the purpose is also frequently used to moisten dyed or bleached cotton. Stock of this kind leaves the dryer overheated and requires the addition of moisture before it is in proper condition for further manufacturing operations.

Our engineers design special equipments for unusual purposes.
What is your problem?

Parks-Cramer Company
Engineers & Contractors
Industrial Piping and Air Conditioning
Fitchburg Boston Charlotte



Stafford automatic bobbin-changing loom with high take-up roll.

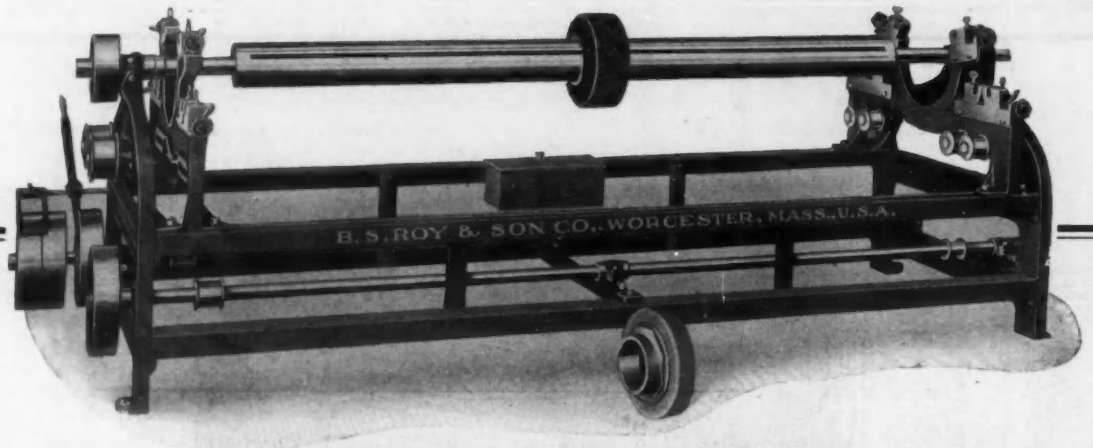
Stafford Looms Increase Production

We manufacture a complete line of automatic looms, both shuttle and bobbin-changing for weaving practically every type of fabric that can be made with a single shuttle. ¶ Stafford shuttle-changing looms will handle cop filling just as successfully as bobbin filling. We have a loom for every kind of yarn, coarse or fine, and for practically every variety of fabric, plain or fancy.

THE STAFFORD COMPANY
WEAVING MACHINERY
READVILLE, MASS.
Southern Agent—J. H. MAYES, Charlotte, N. C.

PATERSON OFFICE
502 COLT BLDG.
PATERSON, N. J.

CANADIAN REPRESENTATIVES
WHITEHEAD, EMMANS, LTD.
MONTREAL



Roy Grinders—Machine "Insurance"

To the manufacturer who owns expensive Napping or Carding Machines, the possession of a Roy Grinder is like an insurance policy protecting him against loss due to dull rolls.

Roy Grinders are made by an organization that has concentrated on the manufacture and improvement of Grinding Machines for Textile Mills exclusively for 50 years.

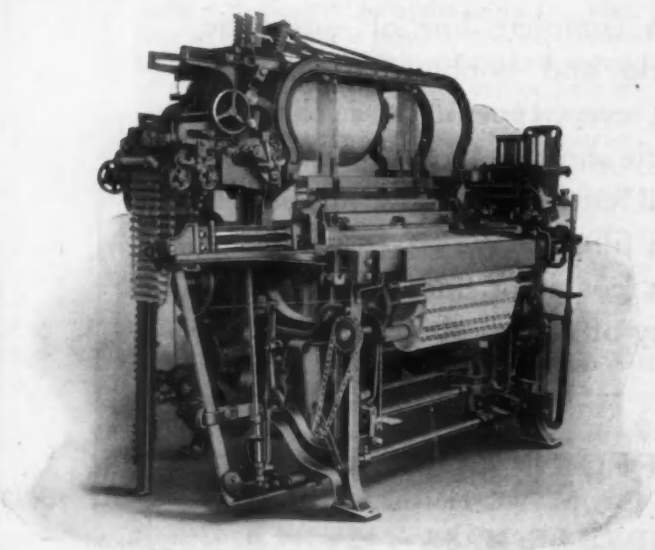
The Roy Line includes Grinders for Cotton and Woolen Cards, Nappers, Garnetts and Calender Rolls. In these machines every practical means has been employed to increase their efficiency, capacity and durability.

Write for Bulletins

B. S. ROY & SON CO., Worcester, Mass.

Established 1868

E. M. TERRYBERRY, Southern Agent, 1126 Healy Bldg., Atlanta, Ga.



Automatic Terry Towel Loom

The AUTOMATIC TERRY TOWEL LOOM shown here, is of the Dobby type and is used for weaving towels with colored borders.

A large number of these looms are running successfully with increased production per weaver and greatly reduced operating costs.

CROMPTON & KNOWLES LOOM WORKS

—WORCESTER, MASS.—

PROVIDENCE, R. I. PHILADELPHIA, PA. PATERSON, N. J.

ALEXANDER & GARSED—Charlotte, N. C.—Southern Representatives

American Textile Machinery Corp., 47 Ave. de l'Opera, Paris—Representatives for Continental Europe

Immediate Delivery!

GREIST

LOOM DROP WIRES

Are made of a special grade heddle wire. They are uniformly finished, accurate in design, free from burrs. A comparative test will readily convince you that they are superior to any drop wires on the market.

Because of our large manufacturing facilities we are able to fill orders of any size immediately. In addition to our many standard designs, we are prepared to make drop wires in any quantity from your own specifications.

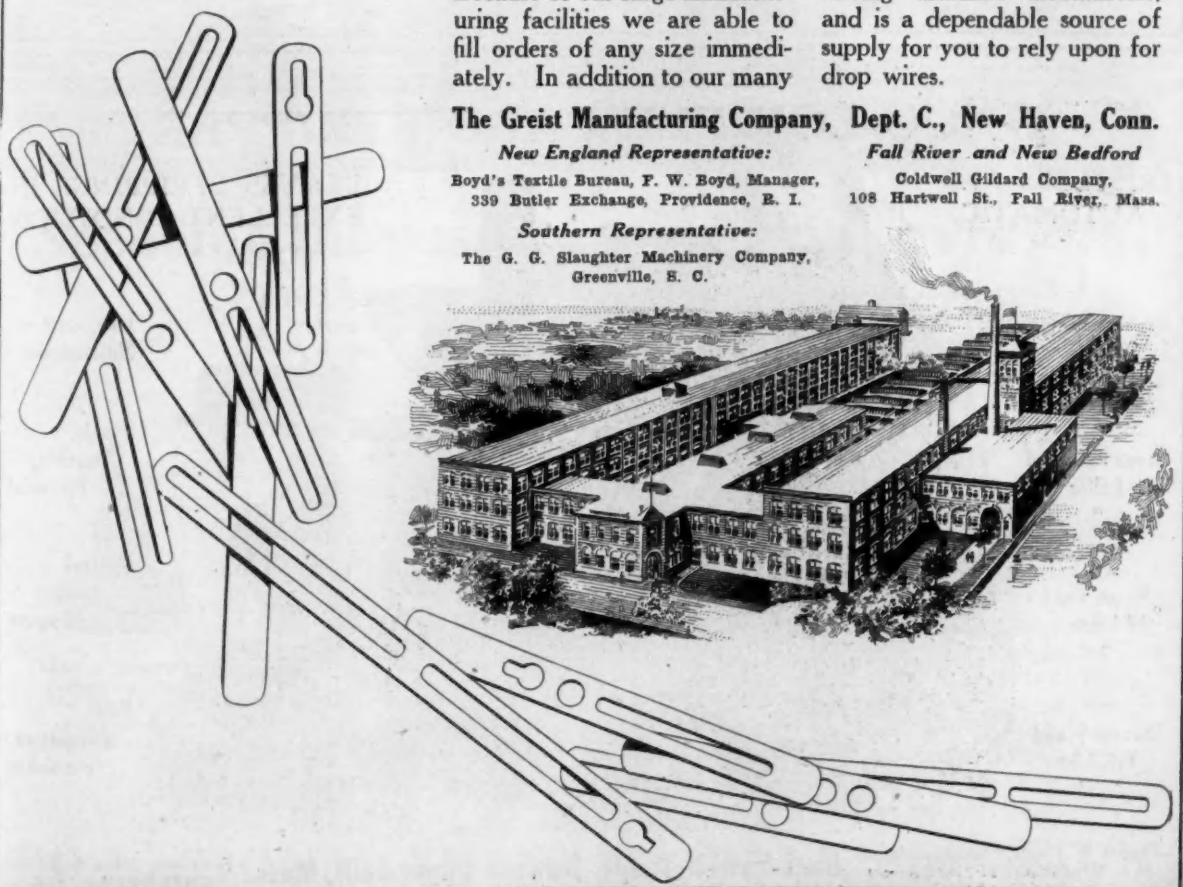
Since 1871 the Greist Manufacturing Company has been the world's largest maker of sewing machine attachments, and is a dependable source of supply for you to rely upon for drop wires.

The Greist Manufacturing Company, Dept. C., New Haven, Conn.

New England Representative:
Boyd's Textile Bureau, F. W. Boyd, Manager,
339 Butler Exchange, Providence, R. I.

Fall River and New Bedford
Coldwell Gildard Company,
108 Hartwell St., Fall River, Mass.

Southern Representative:
The G. G. Slaughter Machinery Company,
Greenville, S. C.



Before spending any more money on picker sticks, ask us to send you a supply of free samples. They will only cost you the price of a two-cent stamp and you will soon learn how to save money on your loom-supply bills. It is well worth your time to write us today.

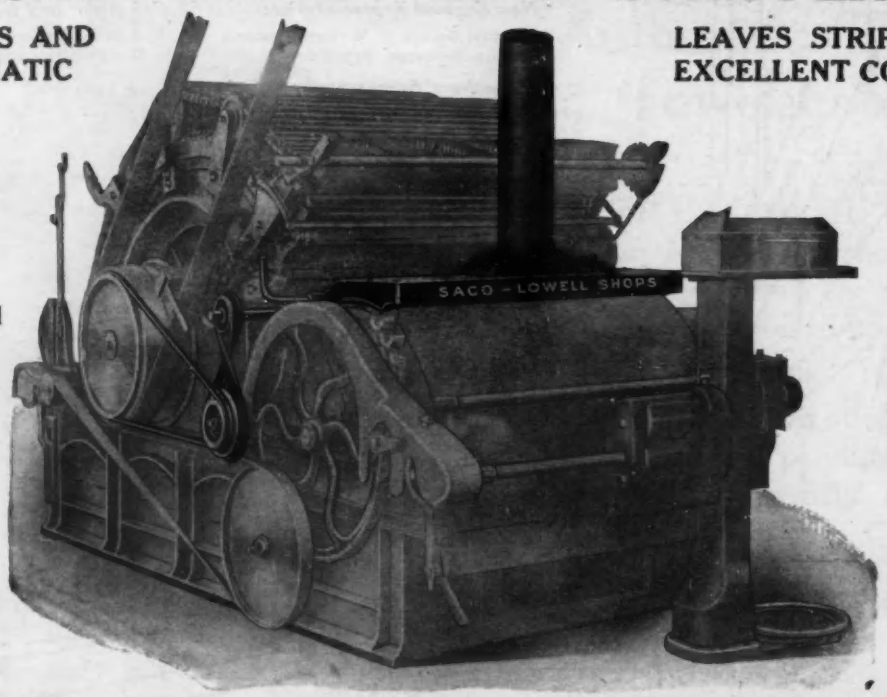
Southern Bending Company

Johnson City, Tennessee

SACO-LOWELL CARD STRIPPER

DUSTLESS AND AUTOMATIC

LEAVES STRIPPINGS IN EXCELLENT CONDITION



Economical to Operate

Saves Time and Labor

Strips Card Clean

Sanitary and Efficient

Low Cost of Maintenance

Simple, Durable, Practical

Control Always Absolute

Full Information Furnished

Rogers W. Davis, Southern Agent
CHARLOTTE, N. C.

Saco-Lowell Shops, Newton Upper Falls, Mass.

Southern Branch Office
GREENVILLE, S. C.

Speeding the passage to markets overseas

Special inquiries concerning Boston Port facilities are cordially invited.

THERE WAS A GOLDEN ERA when our swift clipper ships were acknowledged by all nations as the pacemakers of international commerce — *ships built, owned, chartered and sailed by splendid types of American manhood.*

The descendants of these men upheld the glory of fine marine traditions during pre-war days when our national colors nearly vanished from the seas for lack of federal support. To them must go much credit for developing the Port of Boston to its present high efficiency.

Benjamin T. Reed, first president of The Warren Bank, which afterwards became The National Shawmut Bank, was secretary of the citizens' committee which successfully solicited Samuel Cunard in 1839 to establish Boston as a terminal for his projected trans-Atlantic steamship line. Since that year, The National Shawmut Bank has been a leader in many movements to improve the port facilities and expedite the handling of merchandise.

Ten hours closer to Europe than is New York; one of the finest harbors in the world, berth space at piers for forty large ocean steamers; ample storage and mechanical devices; three important railroads with freight terminals at deep water—these are among the many advantages of the Port of Boston. Another is the very comprehensive service this bank furnishes to exporters, importers and shipping interests, wherever located.

THE NATIONAL SHAWMUT BANK *of* BOSTON

***Resources exceed* $200,000,000**

Howard Bros. Mfg. Co.

Established 1866

Atlanta, Ga. Worcester, Mass. Philadelphia, Pa.

CARD CLOTHING

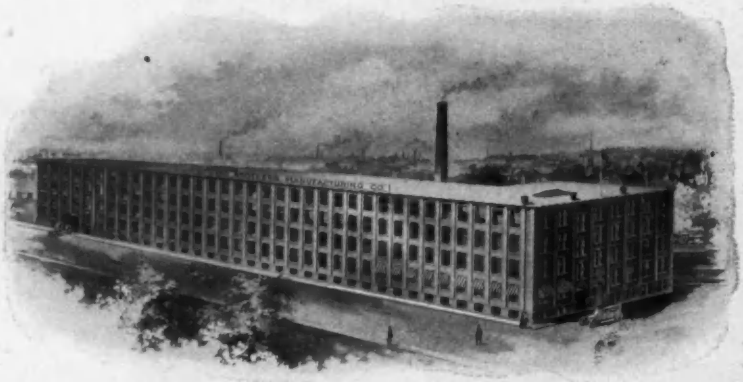
Napper Clothing

Wire Heddles

Cylinder Fillets

Doffer Fillets

Top Flats Reclothed



Hand Stripping Cards

Stripper Fillets

Burnisher Fillets

Emery Fillets

Southern Agent

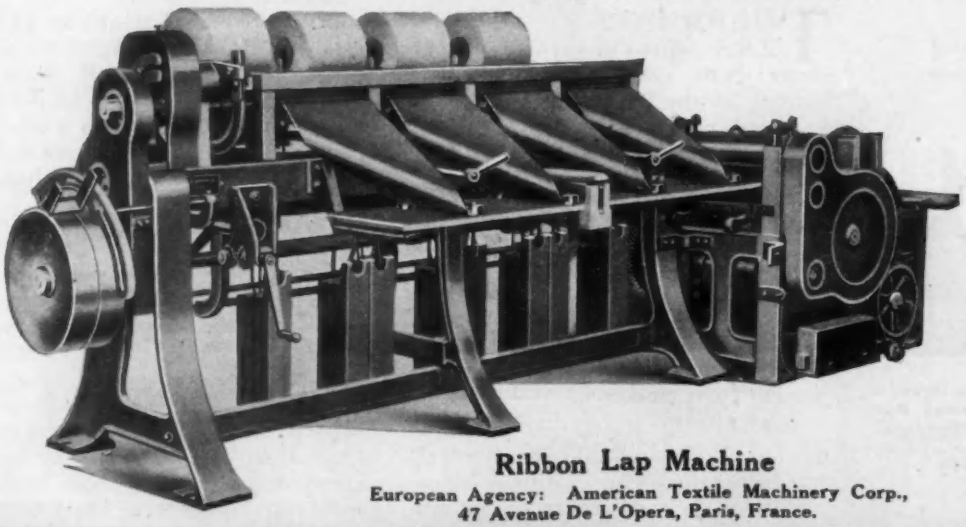
E. M. TERRYBERRY, 1126 Healey Building, ATLANTA, GA.

WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY

Manufacturers of Combing Machinery



Ribbon Lap Machine

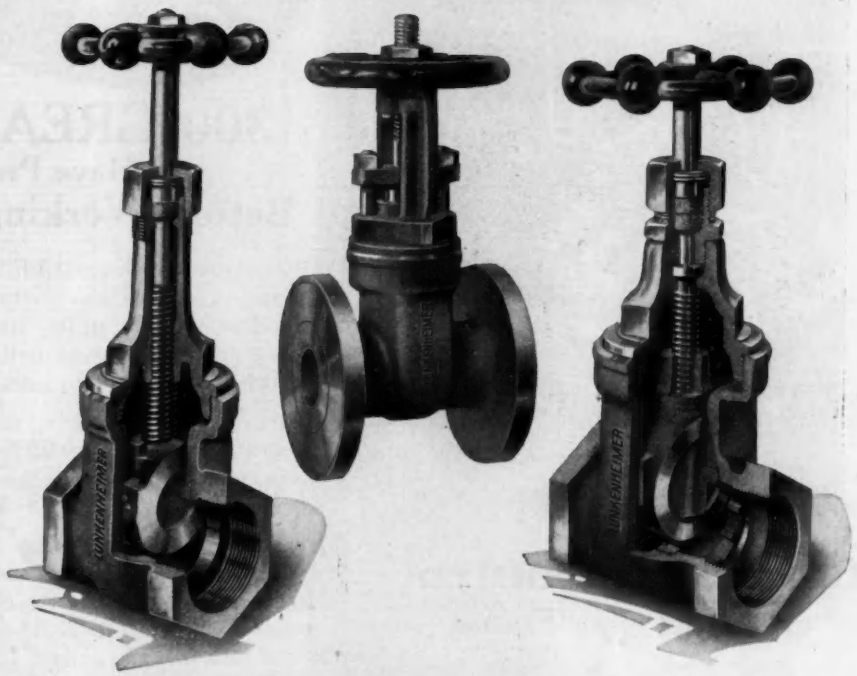
European Agency: American Textile Machinery Corp., 47 Avenue De L'Opera, Paris, France.

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.

LUNKENHEIMER
Bronze Gate Valves



See our Exhibit at the SEVENTH NATIONAL EXPOSITION CHEMICAL INDUSTRIES New York City Sept. 12-17 1921

LUNKENHEIMER BRONZE GATE VALVES remain tight under extreme operating conditions because the design is correct, the material is the well known LUNKENHEIMER "Valve-Bronze" and they are made with the skill which characterizes all LUNKENHEIMER Products.

The "double taper wedge seat" construction embodied in LUNKENHEIMER Bronze Gate Valves has proved its practicability. In addition to tightness, it insures ease of operation, minimum wear and consequent long service life.

The DOUBLE DISC TYPE for pressures up to 150 pounds has a simple and practical ball and socket bearing between the discs which makes them self adjusting and eliminates the needless maintenance cost prevalent on valves employing a greater number of working parts.

The WEDGE DISC type has a single disc, with the seats finished in exact alignment with the disc faces, and the seatrings are renewable on sizes one inch and larger. Made with Inside Screw Stationary Stem, and with Outside Screw and Yoke Rising Stem for pressures up to 200 and 300 pounds.

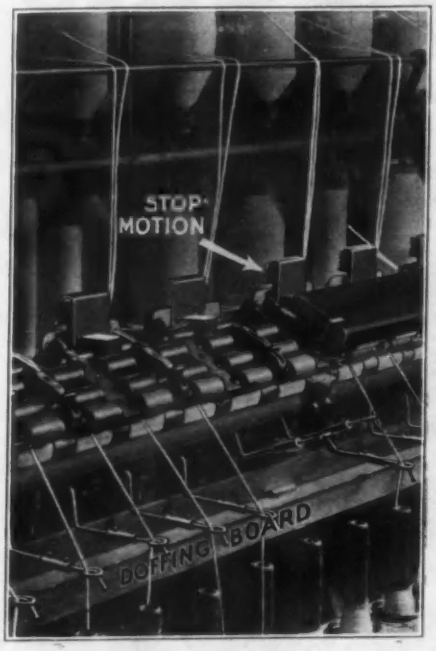
LUNKENHEIMER BRONZE GATE VALVES are obtainable from LUNKENHEIMER Distributors situated in every commercial center. Insist on having the genuine.

THE LUNKENHEIMER CO.
"QUALITY"
LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD
NEW YORK CHICAGO CINCINNATI BOSTON LONDON
EXPORT DEPT. 129-135 LAFAYETTE ST., NEW YORK

CURRENT EDITION OF CATALOG BEARS No 58 COPIES PROCURABLE FROM LUNKENHEIMER DISTRIBUTORS

11012 8-10

THE "ECLIPSE" STOP-MOTION DEVICE



Complete Control
of the Spinning Frame

The complete control of the spinning frame is placed in the hands of the operative. When an end breaks the STOP-MOTION automatically covers the roving and instantly stops waste. It also operates when one or both bobbins are emptied, thus allowing all of the roving to run from bobbins. 90% saving is made in waste, not to speak of the labor saving and the prevention of mutilated bobbins.

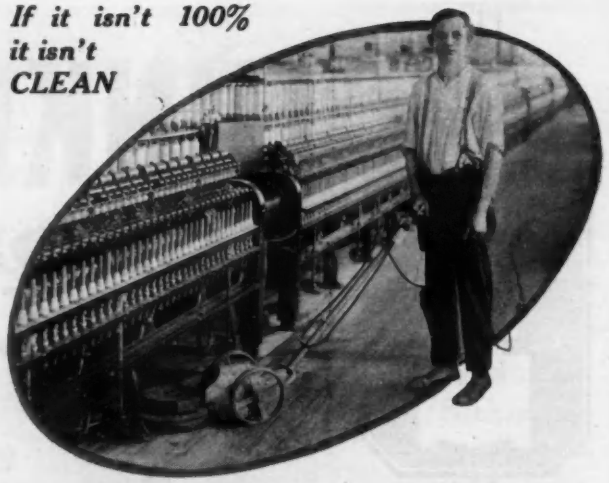
Actual operating conditions prove that this perfect device makes these worth-while savings in waste and furthermore saves 40% of labor cost of spinning, increasing the efficiency of spinning frame operatives wonderfully.

No more rolls can become spoiled by laps. The leather remains true and free from bruises. This decreases broken ends and produces a more even yarn. There is 95% perfect condition of rolls and a 75% saving in top roll coverings.

Let us send you full information.
A line today will bring it promptly.

Eclipse Textile Devices, Inc.
Elmira, N. Y.

If it isn't 100% it isn't CLEAN



300 GREAT MILLS
Have Provided
Better Working Conditions

By scrubbing floors CLEAN — the Finnell way — three hundred great mills have made their employees better, healthier, happier workers.

This policy is paying big dividends in better production, reduced labor turnover and greater loyalty.

And besides all this, the FINNELL SYSTEM saves scrubbing labor, reduces waste, soilage and accidents, and effects better light and CLEAN air.

Any mill can do the same thing. Sizes make no difference. Small mills need less equipment but results are just as profitable in proportion.

Write today for complete information on this necessary equipment. State amount of floor space you use, for there is an economical size outfit

For Any Size Mill

CLEAN FLOORS

Interesting facts and convincing proof will be sent free to mill executives on request. No obligation.

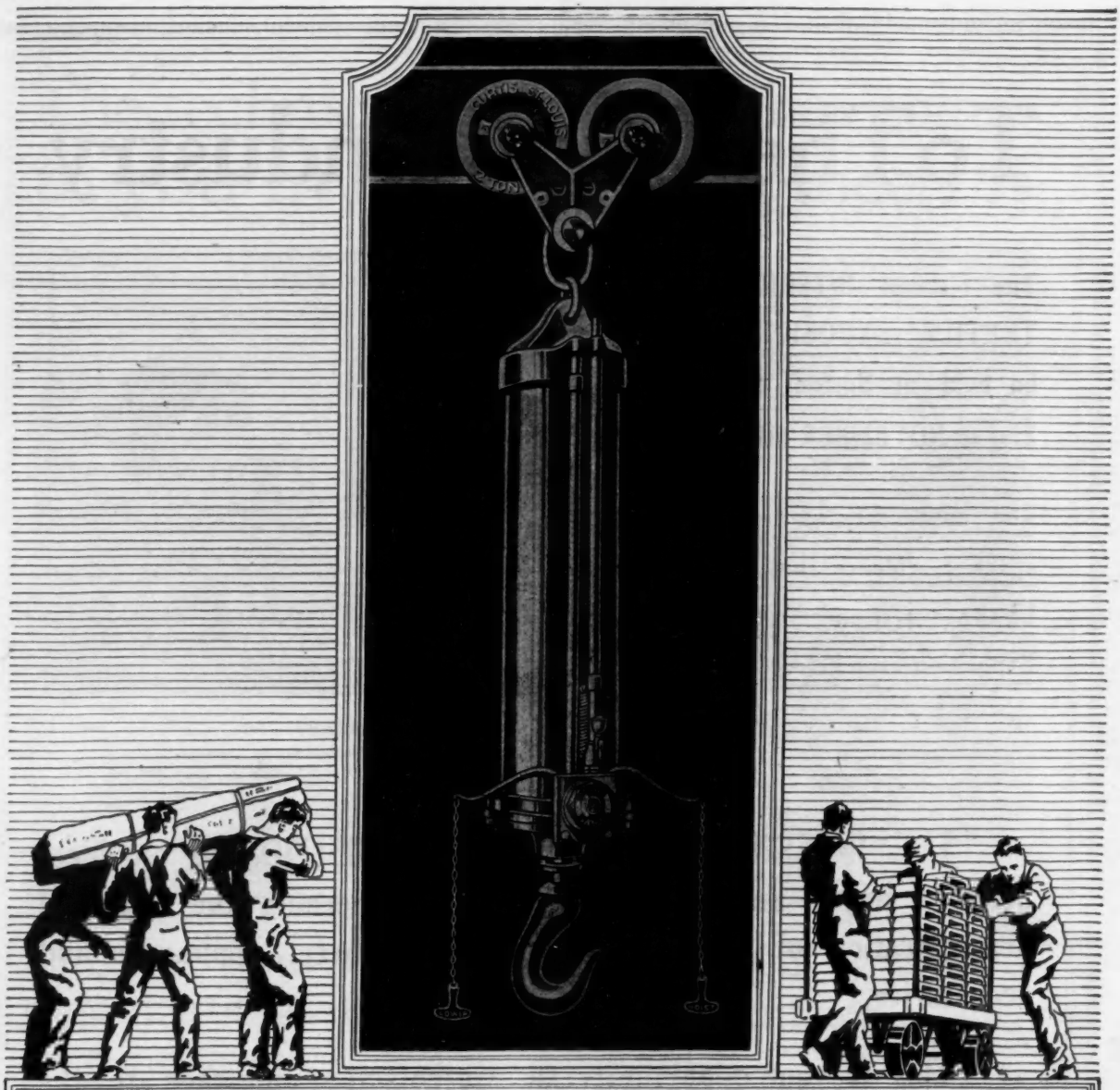
Write today

American Scrubbing Equipment Co.

General Offices and Factories
Hannibal, Mo.
District Offices in Principal Cities.

CLEAN FLOORS
Reflect Clean Business

FINOLA
SCOURING POWDER
GIVES BEST RESULTS



CURTIS AIR HOISTS and TROLLEYS
SAVE MAN-POWER

CURTIS Trolleys are constructed with self-equalizing steel side frames and large inclined wheels fitted with shock-absorbing Hyatt Flexible Roller Bearings—making them easy to start—easy rolling and long lasting.

CURTIS All-Steel Air Hoists, in design and construction, present the perfected results of 25 years of manufacture. They are simple, safe and economical for light and medium loads. Capacities, 800 to 20,000 lbs.

CURTIS PNEUMATIC MACHINERY COMPANY

1571 Kienlen Avenue ST. LOUIS, U. S. A.

Branch Office: 532-R Hudson Terminal, New York City

To The Textile Industry

The biennial INTERNATIONAL TEXTILE EXPOSITION will be held at Boston, OCTOBER 31st to NOVEMBER 5th.

The unprecedented demand for space is evidence that this will be the largest and most complete Exposition ever held.

MECHANICS BUILDING
Home of the International Textile Exposition
October 31st to November 5th

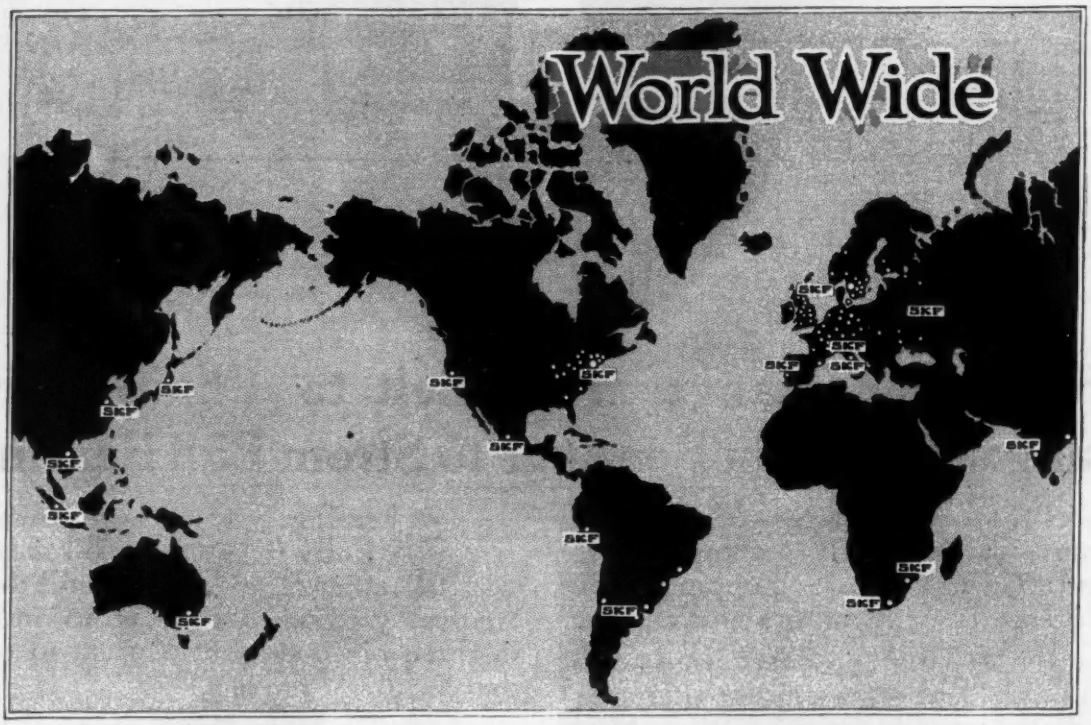
THE INTERNATIONAL TEXTILE EXPOSITION is an ideal place for buyer and seller to meet—and permits the practical demonstration of new and improved machinery, appliances and accessories.

This is your opportunity to present your message to the TEXTILE Manufacturers—Chalk down the date NOW—OCTOBER 31st to NOVEMBER 5th and the place MECHANICS BUILDING, Boston, Mass., and then write for further particulars to

CHESTER I. CAMPBELL
Director
5 Park Square Boston

Auspices of the Textile Exhibitors Association, Inc.

The technical knowledge that comes to you from SKF engineers is



as it is the sum of the data gathered by SKF organizations in all industrial countries.

This fund of engineering information we bring to the fabrication of all products bearing the mark SKF and the operation of those industries which we are requested to supervise. In order that complete reliance may be placed in the endorsement expressed by the mark SKF it is necessary not alone that we control and supervise each step in the manufacture of a product but also its final installation.

Because every effort is made to assure the most satisfactory use of products marked SKF we welcome requests for information concerning their proper application and maintenance.

Textile manufacturers should feel that this technical knowledge is always available. You are urged to use it freely without any sense of obligation.

SKF Industries, Inc.
165 Broadway, New York City

Supervising at the request of the stockholders.
The Hess-Bright Manufacturing Co.
The Skayef Ball Bearing Co.
Atlas Ball Co.
Hubbard Machine Co.
SKF Research Laboratory

620

When You Change from Belt to Chain Drive Change from Plain Bearings to Strom Ball Bearings

Individual chain drives for spinning frames are steadily gaining favor, and many mills are equipping their old frames with motors and chains.

As the driving sprockets used with chains are always smaller than the pulleys previously used, the chain drive puts a greater load on shaft and bearings than they were originally designed to carry. This frequently causes hot bearings with excessive wear and loss of power, and increased oil consumption.

Strom ball bearings will not only carry the increased load safely and without heating, but will save power and oil. Fully 95% of the oil used with plain bearings is saved, and the frequency of oiling reduced to once in three or four months. instead of daily.

Strom bearings will also keep the shaft lined up better than plain bearings, and this will prevent wear on the chain and sprockets.

Bearings and housings for different makes of spinning frames may be obtained from the Aldrich Machine Works, Greenwood, S. C.

The U. S. Ball Bearing Mfg. Co.

(Conrad Patent Licensee)

4544 Palmer St., Chicago, Illinois.

156

Strom BEARINGS

BY INVITATION MEMBER OF

NEW YORK, U.S.A.

IN THE FINAL ANALYSIS——CAST IRON PULLEYS

Have you ever thought of the pulley troubles you have had and how invariably the drive was made satisfactory by installing Cast Iron pulleys—either supplanting pulleys of some other type or by changing to cast iron pulleys of suitable construction?

BUT IT WAS A CAST IRON PULLEY THAT FINALLY STOOD UP UNDER THE SERVICE.

Almost every user of power has had this experience and always the solution of continuously satisfactory transmission service has been the installation of cast iron pulleys.

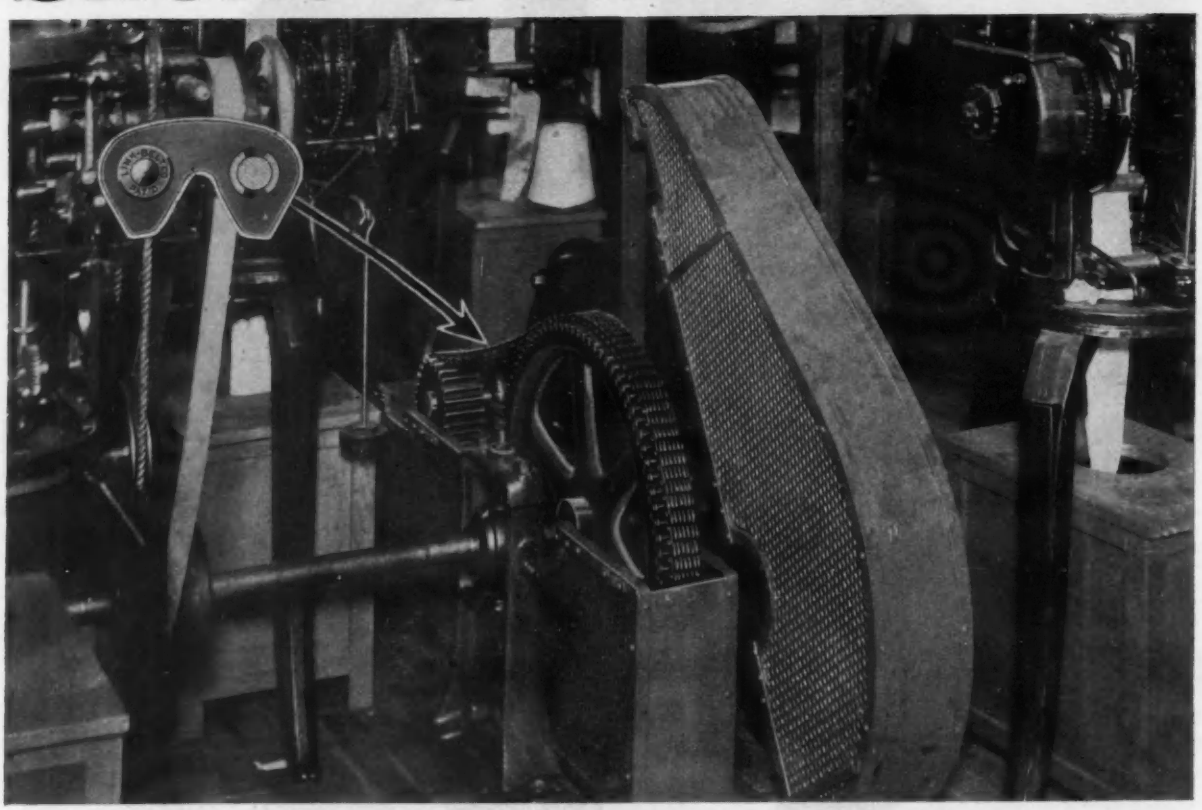
The use of cast iron pulleys in the initial installation will prevent trouble.

T. B. WOOD'S SONS COMPANY, Chambersburg, Penna.

Milton G. Smith, Southern Sales Agent, Greenville, S. C.

POWER TRANSMITTING MACHINERY

LINK-BELT
Silent Chain Drives



Link-Belt Silent Chain Drive to knitting machine lineshaft, Phoenix Knitting Works, Milwaukee, Wis.

"I am an enthusiastic advocate of the Link-Belt Silent Chain Drive. Having seen it effect a tremendous production economy here in our own plant, I have been in a position to form conclusions, based solely upon results obtained".—Charles Bindrich, Phoenix Knitting Works, Milwaukee, Wisconsin.

Mr. Bindrich further states: "I cannot recall a single troublesome moment during our three years of Silent Chain experience. These drives are just as positive in constant service rendered as in power delivered to our machines. Production losses due to belt breakage having been completely eliminated".

We venture that you too would be as enthusiastic over the results obtained from the use of Link-Belt Silent Chain Drives, if you employed them in your mill. Let us install one drive, and then watch for results. Send for booklet No. 425.

728

LINK-BELT COMPANY

PHILADELPHIA		CHICAGO			INDIANAPOLIS
New York . . . 299 Broadway	Huntington, W. Va. . Robson-Prichard Bldg.	Portland, Ore. . . First and Stark Sts.	Denver . Lincoln, Shubart & Co., Boston Bldg.
Boston 9 . . . 49 Federal St.	Cleveland . . . 439 Kirby Bldg.	San Francisco . . 19 Second St.	Louisville, Ky.. Frederick Webb, Starks Bldg.
Pittsburgh . . . 1511 Park Bldg.	Detroit . . . 4210 Woodward Ave.	Los Angeles . . 163 N. Los Angeles St.	New Orleans, . C. O. Hine, 504 Carondelet Bldg.
St. Louis . . Central Nat'l Bank Bldg.	Minneapolis . . 518 S. Third St.	Atlanta . 707 Citizens and Southern Bank Bldg.	Birmingham, Ala. . . .
Buffalo . . . 847 Ellicott Square	Kansas City, Mo. . 306 Elmhurst Bldg.	Toronto, Can. . Canadian Link-Belt Co., Ltd.	S. L. Morrow, 720 Brown-Marx Bldg.
Wilkes-Barre . . 2d Nat'l Bank Bldg.	Seattle . . . 820 First Ave., S.	Montreal, Can. . Canadian Link-Belt Co., Ltd.	Charlotte, N. C., J. S. Cothran, Com'l Bank Bldg.

The Rule of Three
in Turbine Lubrication:

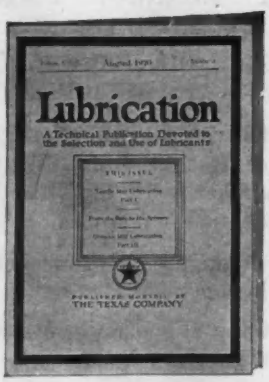
Rule I—The oil must not decompose.

Rule II—It must not form emulsions.

Rule III—It must not cause corrosion of shafts and bearings.

and how

TEXACO TURBINE OILS
measure up:


Lubrication
A Technical Publication Devoted to the Selection and Use of Lubricants
PUBLISHED MONTHLY BY THE TEXAS COMPANY

In this magazine we print month after month, articles covering the problems of lubrication as applied to various industries.

These articles are not theoretical, but based on practical operating experience.

We shall send "Lubrication" to Engineers, Executives, Buyers of Lubricants and others, who are professionally interested and who ask for it—FREE.

1. Texaco Turbine Oils operate over long periods without decomposing. They are pure mineral oils and great care has been taken to keep them free as possible from any materials which might oxidize or might precipitate tarry sludge when exposed to heat and pressure.
2. Texaco Turbine Oils do not cause troubles from the formation of emulsions. They are so highly refined that there are no unsaturated hydrocarbons left in them which will hold water in suspension. They free themselves readily from any water or moisture which may enter the system.
3. They will not cause corrosion of shafts and bearings as the chemically active ingredients which appear in ordinary oils are removed.

The Turbine using Texaco Turbine Oil is assured of a constant stream of clean, cooling oil by virtue of an entire freedom from clogged oil pipes. Texaco Turbine Oils are readily and rapidly filtered.

Likewise, because of negligible evaporation and the resistance to decomposition, only a very little additional oil is needed to make up the small natural losses.

The following Texaco Turbine Oils are recommended:

STATIONARY TURBINES

Ring Oiler Bearings,	
Normal conditions	TEXACO REGAL OIL
Exposed to medium high temperatures	TEXACO ALCAID OIL
Exposed to very high temperatures	TEXACO ALGOL OIL
Circulating Oiling Systems, *Direct drive*	TEXACO REGAL OIL
Circulating Oiling Systems, *Reduction gearea*	TEXACO ALCAID OIL

A Texaco Lubricant for Every Purpose and the best for that purpose.

Get "Lubrication" *free*

-USE THIS COUPON-

THE TEXAS COMPANY

Dept. O, 17 Battery Place, New York City

NEW YORK HOUSTON CHICAGO

Offices in Principal Cities

Kindly put me on your free mailing list for "LUBRICATION."

Name ---------- *Street* ----------

City ---------- *State* ----------

8-21

The Sign of Efficiency

MORSE SILENT CHAIN DRIVES

THE MORSE "ROCKER JOINT"

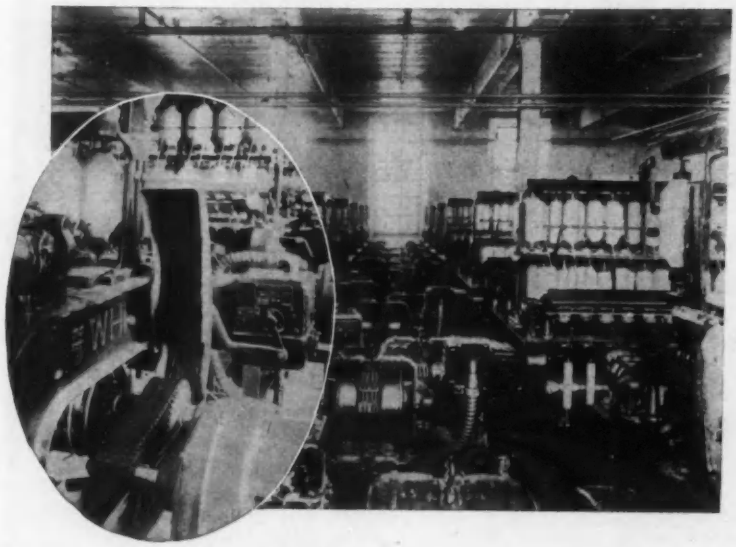
The Sign of Durability

Positive as Gears

Flexible as a Belt

Longer Life

Writing History in Textile Mill Costs



This Rhode Island mill, "MORSE" equipped. One 450 h.p. drive and One 275 h.p. drive to 320 K. W. and 200 K. W. Generators. Three 10 h.p. drives and Six 15 h.p. drives connecting motors to line shafts. Three Hundred and Seventy-Five drives connecting 5 h.p. and 7½ h.p. individual motors to Spinning Frames.

IT'S NO SECRET

It's the Rocker Joint Silent Chain With Center Guide Links

UNIFORM SPEED INCREASING PRODUCTION

SMOOTH RUNNING IMPROVING QUALITY

RUN COOL, OIL BATHS NOT REQUIRED—99% EFFICIENT

We can tell you the Mills that are using the Morse Rocker Joint Silent Chain Drive together with the Data of Production—

Have you figured your belt slippage costs?

Isn't the slip usually 5% to 8% in every belt?

The older the belt the greater the loss in production?

Another "MORSE" in the Textile Industry

The engineer's chief concern was the mechanical equipment of this mill, knowing the final cost accounting depend primarily on the power factor and its transmission to the working parts. The factors of upkeep and dependability were considered, a shut down or slowing up of but a short time might write o ffthe profits of a year. There was but one answer: "MORSE"!

Quiet
Clean
Better Light
Short Centers
Positive Speed Ratios
Better Arrangement
Less Overhead
Without Slip

SEE OUR EXHIBIT AT THE SEVENTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES 8TH COAST ARTILLELY ARMORY, NEW YORK WEEK OF SEPTEMBER 12TH.

Let us have your problem. You will be in no way obligated.

BENEFIT BY MORSE SERVICE AS OTHERS DO

Write Today for Technical Textile Booklet

MORSE CHAIN CO. — ITHACA, N. Y.

Largest Manufacturer of Silent Chains in the World

Address Nearest Office

MORSE ENGINEERING SERVICE — ASSISTANCE WITHOUT OBLIGATION

BALTIMORE, MD.....E. R. Morse, Mgr., 1402 Lexington Bldg.
BOSTON, MASS.....141 Milk Street
CHICAGO, ILL.....Merchants Loan and Trust Building
CLEVELAND, OHIO.....Engineers Building
DETROIT, MICH.....1503 Woodward Avenue
CHARLOTTE, N. C.....404 Commercial Bank Building
NEW YORK CITY.....50 Church St., Hudson Terminal Building
PHILADELPHIA, PA.....302 Harriam Building
PITTSBURGH, PA.....Westinghouse Building
SAN FRANCISCO, CAL.....Monadnock Building
ATLANTA, GA.....Earl F. Scott, & Co., 702 Candler Building
CANADA.....Jones & Glassco, Reg'd, Montreal, St. Nicholas Bldg., Toronto, Traders' Bank Building.
KANSAS CITY, MO.....Morse Engineering Co., Finance Building
MINNEAPOLIS, MINN.....Strong-Scott Mfg. Co., 413 Third St. S.
ST. LOUIS, MO.....Morse Engineering Co., Chemical Bldg.

Morse is the Guarantee Always Behind the Efficiency, Durability and Service.

CRANE

Pipe Bends

There is considerably more to a pipe bend than just the plain process of bending a piece of pipe. A pipe bent to proper radius, proper tangents, and arranged to take care of required expansion justifies the expense incurred. Sometimes it is possible to arrange one bend to take care of the entire expansion of a long run of pipe. Properly designed pipe bends relieve the entire system of expansion strains, reduce leakage at the joints, and eliminate up-keep cost.

We make all types of bends from any size pipe

We are manufacturers of about 20,000 articles, including valves, pipe fittings, and steam specialties, made of brass, iron, ferrosteel, cast steel and forged steel, in all sizes, for all pressures and all purposes, and are distributors of pipe, heating and plumbing materials.

SALES OFFICES, WAREHOUSES AND SHOWROOMS:

BOSTON, SPRINGFIELD, HARTFORD, BRIDGEPORT, ROCHESTER, NEW YORK, HARLEM, ALBANY, BROOKLYN, PHILADELPHIA, READING, ATLANTIC CITY, NEWARK, CAMDEN, BALTIMORE, WASHINGTON, SYRACUSE, BUFFALO, SAVANNAH, ATLANTA, KNOXVILLE, BIRMINGHAM, MEMPHIS, LITTLE ROCK, MUSKOGEE, TULSA, OKLAHOMA CITY, WICHITA, ST. LOUIS, KANSAS CITY, TERRE HAUTE, CINCINNATI, INDIANAPOLIS, DETROIT, CHICAGO, ROCKFORD, OSHKOSH, GRAND RAPIDS, DAVENPORT, DES MOINES, OMAHA, SIOUX CITY, ST. PAUL, MINNEAPOLIS, WINONA, DULUTH, FARGO, WATERTOWN, ABERDEEN, GREAT FALLS, BILLINGS, SPOKANE, SEATTLE, TACOMA, PORTLAND, POCATELLO, SALT LAKE CITY, OGDEN, SACRAMENTO, OAKLAND, SAN FRANCISCO, LOS ANGELES

FOUNDED BY R. T. CRANE, 1855

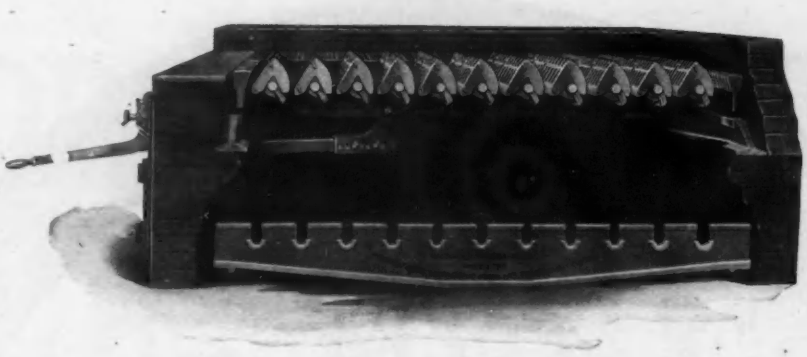
CRANE CO.

836 S. MICHIGAN AVE.

CHICAGO

WORKS: CHICAGO AND BRIDGEPORT

CRANE LIMITED MONTREAL, TORONTO, VANCOUVER, WINNIPEG, LONDON, ENG., SYDNEY, N. S. W., QUEBEC, HALIFAX, OTTAWA, REGINA, CALGARY.



MACDONALD
SHAKING GRATE

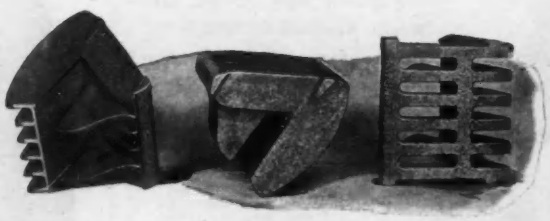
is a perfect grate that will help you to lower costs in your boiler room and produce a free steaming boiler.

With the MacDonald Shaking Grate, you are SAVING MONEY. You are SAVING FUEL. There are several reasons for the superiority of the MACDONALD Shaking Grate:—

1—Unrestricted air passages. 2—Fool-proof locking device. 3—Fuel cannot be wasted when grate is being shaken. 4—Powerful leverage for shaking and breaking up clinker. 5—Grates may be repaired or renewed at negligible expense by replacing top sections only. 6—Detachable top sections may be changed to give any desired air opening or spacing of grate. 7—Proper distribution of metal gives the greatest strength possible in proportion to weight of the material. 8—When shaken the maximum irregularity of depth of vibration is given without opening a wide space between sections. 9—A flat grate locked in position so that the surface cannot be left uneven or with points projecting into the fire.

Write today for full particulars.

Top sections which make it unnecessary to replace an entire expensive bar when a portion of it wears out. Maintenance expense is therefore cut to the bone.



Let us tell you more about this perfect coal-saving grate, and how it will save you money.

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

Southern Representative,
Isaac Hardeman, Charlotte, N. C.

BOSTON
PHILADELPHIA

NEW YORK
SAN FRANCISCO

TUPELO

("THE HARD-WEAR")

LUMBER

Tramp! Tramp!! Tramp!!!

go the feet on a TUPELO FLOOR, and that floor seems to—and actually does—grow smoother, because of Tupelo's "involved" or closely "knitted" grain which prevents slivering or splintering and *reduces the wearing.*

Roll! Roll!! Roll!!!

go the truck wheels over the TUPELO FLOOR in a Textile Mill, a Warehouse or on a Platform where the wear from truck wheels is constant and severe. These are the uses where

Tupelo Stands the Gaff

and refuses to wear down—or out.

Tupelo is *Made* for Hard Wear

If you're going to lay a floor, or have one laid, you want the whole "TUPELO tale." We know it "by heart" and will be glad to tell it.

Will you kindly write and ask for the particulars? Address,

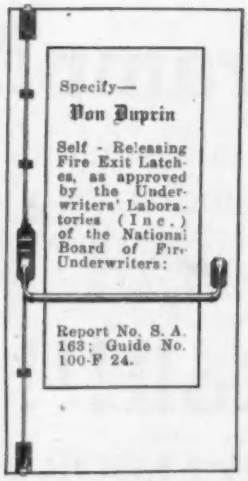
SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

805 Poydras Building, New Orleans, La., or 805 Graham Building, Jacksonville, Florida

(Please address office nearest you)

Von Duprin

Self-Releasing Fire Exit Latches


Specify—
Von Duprin
Self - Releasing Fire Exit Latches, as approved by the Underwriters' Laboratories (Inc.) of the National Board of Fire Underwriters:
Report No. S. A. 163; Guide No. 100-F 24.

RELIABILITY FIRST!

Reliability is the first consideration in making Von Duprin Self-Releasing Fire Exit Latches. Neither trouble nor expense is spared to insure it.

The result is apparent in the perfect service these latches give, day after day, month after month, and year after year.

And then—in time of peril—Von Duprin reliability is worth, a thousand times over, what it cost. It may mean the saving of a dozen human lives.

Completely equipping a building with Von Duprin latches is an insignificant item in the cost—yet it means easy, trouble-free operation of the doors, and increased safety for the inmates in an emergency.

Remember that no Von Duprin has ever failed to operate in an emergency.

Ask for Catalog 12-T, and the new booklet, "Saving Lives."

VONNEGUT HARDWARE CO.
Indianapolis, Ind.

Junior High School,
Harrisburg, Pa.
C. Howard Lloyd, Architect.

A LIVE-GOING TOWN FOR SALE

Following the recent destruction by fire of our lumber manufacturing plant and arrangements made for the handling of standing timber by our other nearby mills, we offer to manufacturing interests the entire town of

Longville, Louisiana

THIS community town, built by us in 1907, possesses many distinct advantages as a site for manufacturers; particularly those confronted with the necessity of providing attractive and comfortable homes for employees. Longville consists of three hundred modern houses, fronting on graded streets set with shade trees; a new brick and stone bank building, three-story hotel, electric light plant, waterworks, large general merchandise store, a meat market equipped with cold storage; new cotton gin, motor fire apparatus, community church, physicians' office building, post office, telephone office, stable and garage. An ample supply of pure water is obtained from both deep and shallow wells. Large supply of fuel and raw material for naval stores, wood pulp, etc., available. The town is located on the Lake Charles & Northern Ry. (a line owned and operated by the Southern Pacific System) 110 miles from Houston, 339 miles from Dallas, 167 miles from Galveston, 20 miles from Lake Charles, 87 miles from Beaumont, a deep water port and oil refining center; 149 miles from Shreveport, 245 miles from New Orleans and 15 miles from De Ridder, the latter a junction point of the Santa Fe, Kansas City Southern and L. C. & N. Rys. Health conditions the very best, as Longville is located in that part of the Highlands of Louisiana known as the "Ozone District."

This unusual offer presents a rare opportunity to manufacturers of textiles, paper, fiber and corrugated shipping cases, wall board, wood pulp, naval stores products, or any other industry employing a large force of steady labor, where proper housing facilities for employees and buildings for mercantile esablishments are a requisite.

Inquiries for additional information are invited from responsible concerns. Please address all communications to E. C. N. Brown, Secretary.

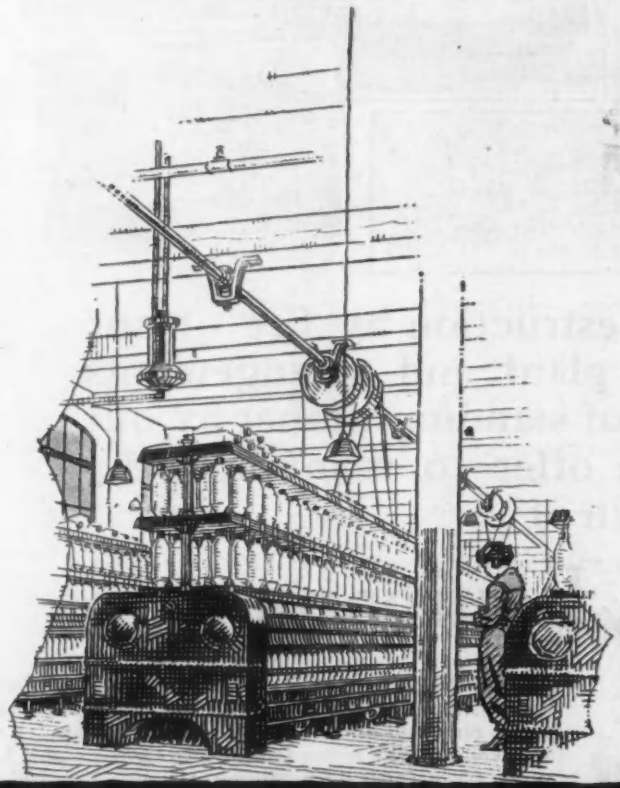
THE LONG-BELL LUMBER COMPANY

R. A. Long Building **Kansas City, Missouri**

OJACO

MILL·WHITE

Gives Radiant Light that speeds Production in the Spinning Room.



IN the spinning room, where thousands of intricate machinery parts function at high speed, light, properly diffused and distributed, is a vitally important factor in quality and quantity of production.

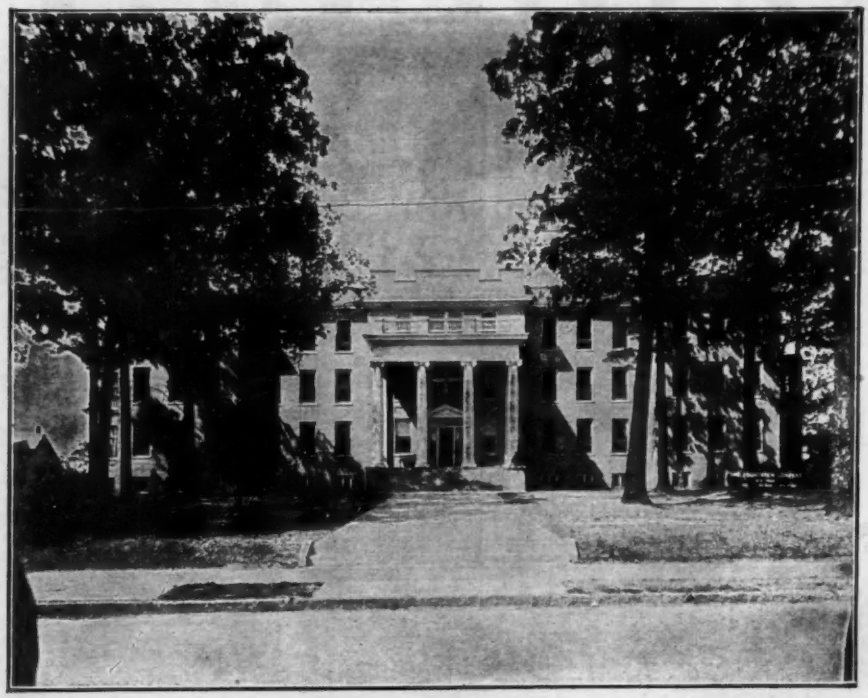
Your lighting cost will be lower—your product better—your workers more efficient—if your walls and ceilings are coated with OJACO Mill White. It is first assistant to daylight. Try it.

OLIVER JOHNSON & CO., Inc.

Paint Makers

Providence, R. I.

DISTRIBUTORS: Cowles & Bleckley, Atlanta, Ga.; Charlotte Supply Co., Charlotte, N. C.; B. A. Cook Co., Fitchburg, Mass.; J. B. Farnum Co., Woonsocket, R. I.; Alexander Grant's Sons Co., Syracuse, N. Y.; Wm. F. Harticon, Fall River, Mass.; Lewis E. Tracy Co., Boston, Mass.; F. P. Van Hosen Co., Rochester, N. Y.; M. F. Bragdon Paint Co., Portland, Me.; Dwelle-Kaiser Co., Buffalo, N. Y.; American Hard Wall Plaster Co., Utica, N. Y.



ATHENS GENERAL HOSPITAL, ATHENS, GA.
J. W. BARNETT, ARCHITECT & ENGINEER—THE FOUNDATION CO., CONTRACTORS.

This building is illustrative of the variety of work The Foundation Company is doing throughout the country. Our clients get the same satisfactory service regardless of the character of the job or its size.

THE FOUNDATION COMPANY

ATLANTA

NEW YORK
NEW ORLEANS
CHICAGO
PITTSBURGH
DETROIT
SAN FRANCISCO
MONTREAL, CANADA
PARIS, FRANCE
LIMA, PERU
HAVANA, CUBA
TAMPICO, MEXICO

CONDULETS

Condulet the Job

Flexible Fixture Suspension

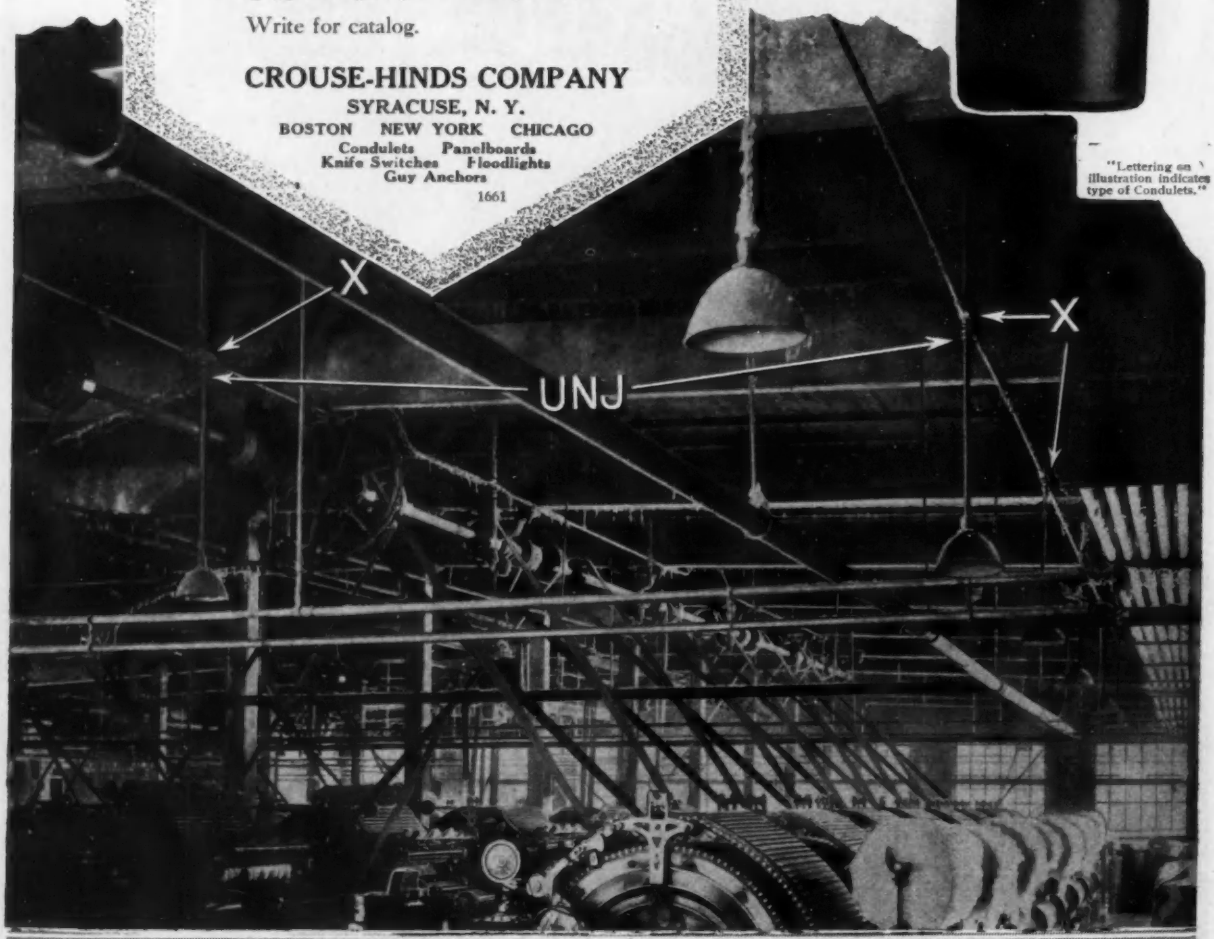
RIGID lighting pendants are unsightly because they seldom hang plumb and are also easily broken or bent. Flexible cord pendants are short lived and dangerous.

All of these objections are overcome by using type UNJ at point of suspension.

Write for catalog.

CROUSE-HINDS COMPANY
SYRACUSE, N. Y.
BOSTON NEW YORK CHICAGO
Condulets Panelboards
Knife Switches Floodlights
Guy Anchors
1661

TYPE UNJ
cut-away to show swivel action.



"Lettering on illustration indicates type of Condulets."

CROUSE-HINDS

COTTON

Published Monthly by

W. R. C. Smith Publishing Co., Dalton and Atlanta, Ga.

L. L. ARNOLD, Editor. **R. W. PHILIP, Associate Editor.**

Editorial and Advertising Departments, Grant Building, Atlanta, Ga. Subscription price, $1.00 per year; Canada, $1.50 a year; Foreign, $2.00 a year. Entered at the Dalton, Ga., postoffice as second-class matter.

Contributions to the columns of Cotton are solicited and paid for after publication. The name of contributors need not necessarily be used, but must accompany all manuscripts.

Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

Member Associated Business Papers, Inc.

Volume 85 **Member Audit Bureau of Circulation.** **No. 10**

CONTENTS

EDITORIAL—

While the Country Watches—And Prays 743

The Question of Federal Taxation 744

GENERAL AND TECHNICAL—

Popular Textile Chemistry (Sulphide of Soda) 746

World Changes in Production and Markets 747

Indecision—An Execration 750

The World Cotton Conference 751

Cotton Yarns Used by the Hosiery Trade 757

Characteristics of Cotton Required by the Spinner and Present Defects 759

What the Southern Mills Are Doing 761

Cotton Comment 762

The New England Mill Situation 763

Turkey Red Dyeing on Cotton Yarns 765

Old Time Equipment Still in Use 771

Notes About Men You Know 772

HOW OTHER MEN MANAGE—

A Mill Problem for Discussion 775

What Is the Best Card Draft? 775

The Feed Plate and Licker-in 777

Figuring the Yarn Number 779

Enzymes 781

Winding on the Fly Frame 783

Outside Advantages for the Mill Village 785

Card Stripes and the Striper Plate 786

Doffers and Section Hands 787

Supplies—Their Use and Abuse 787

KNITTING SECTION—

Production on Knitting Machines 793

The Knit Goods Market 795

The Truth in Fabric Bill 798

Among the Knitting Mills 799

Knitters Object to Reports 801

Hosiery Tariff Unsatisfactory 801

The Yarn Market 802

A Device to Permanently Improve Your Cotton Cards

The use of Hyatt roller bearings on cotton cards is a simple but mechanically correct method of improving card operations to a profitable extent.

Permanency: The durable rollers operate for many years without appreciable wear and do not require replacement or adjustment throughout the life of the cards. This helps to maintain the close limits between the cylinders and the flat clothing.

Power Saving: Because of the true rolling motion of Hyatt bearings a card equipped with them begins to turn the instant power is applied. Thus at least 25% of the power necessary to start and accelerate the cylinder can be saved, allowing the use of smaller motors if desired.

Lubrication: Oil applied to a Hyatt bearing card remains in the bearing. It does not leak to spoil the cotton or the rubber base of the clothing, and requires replenishment only three to four times a year.

These replacement boxes will bring the permanent, power saving and lubricant saving qualities of Hyatt roller bearings to your present cards for about 2% of the cost of the card. You can get new cards Hyatt equipped for about 1% of the cost of the card extra. Hyatt bearings on cards are investments that pay real dividends.

You'll find it an undeniably good investment to apply Hyatt bearing replacement boxes to your present cards and to specify that all new cards be Hyatt equipped. Write to us for complete information.

Hyatt Roller Bearing Company
New York, N. Y.

With the Publishers—

James A. Branegan

Popular Textile Chemistry.

From time to time the Editorial Department has received letters from readers desiring to know more about the chemicals in common use in the mill and dyehouse. The general tenor of these letters is that while many of the technical articles on chemistry are interesting, they are too technical to be thoroughly understood by the general reader and those who have not had the advantages of a college chemical course. It is of general interest, therefore, to announce that the Editorial Department has completed arrangements with Mr. James A. Branegan to prepare a series of articles on "Popular Textile Chemistry," the first of which appears upon another page of this number. These articles will be carefully written and all details thoroughly explained, so that any reader can understand them. They will naturally be of secondary importance to the professional chemist, but he will be provided with articles of the usual type. In other words, this series is intended to supplement, rather than replace, the type of chemical articles COTTON has utilized in the past.

Mr. Branegan, the author of this series of articles, studied chemistry at Pratt Institute, Brooklyn, N. Y., and later took a two-year private course in Organic Chemistry (coal tar dyes) under Dr. A. C. Langmuir. His first work was in the laboratory and plant of the Martin Kalbfleisch Chemical Co., New York, and later he became associated with the General Chemical Co., as technical representative. When the Kali Manufacturing Company was organized he was its first president, an office which he still retains. In 1911 Mr. Branegan was awarded the Widman Medal for original chemical research. He invented the Branegan acid pump and a special hydrometer for use in tin weighting on silk. He is the author of several articles on chemistry, mostly in the textile line and the weighting of silk. Mr. Branegan is chairman of the Membership Committee of the American Chemical Society, is a member of the Society of Chemical Industry of England, the Engineers' Club of Philadelphia, and the Chemists' Club of New York. During the war Mr. Branegan served under the Alien Property Custodian and held the very important position of Managing Director of the Heyden Chemical Works, an alien concern taken over by the United States Government. This property was sold by the United States Government, the successful bidder being Allan A. Ryan of New York, and Mr. Branegan was then elected vice-president, the office he now holds.

Ever Dream Something Was After You—And You Couldn't Move?

Maybe when you were a youngster you had that dream—that you were being chased by somebody or something and you couldn't move a step! Your feet were like lead—you were rooted to the spot and there seemed no chance to get out of the way of what threatened you. On and on came the menace, near and nearer, until at last—you woke up or some disturbed member of the family roused you.

That's the way it seems sometimes in the cotton manufacturing business. It appears that some handicap is chasing you and you don't seem to be able to move your business feet fast enough to get out of its way. Sometimes the nightmare is a question of production, of improving the quality of the product or the ever-present question of more business or one of the many other hobgoblins that pop up in the cotton industry.

Then along comes a copy of COTTON and wakes you up. Right in that issue you read how some other fellow has had the same experience as you and has solved the problem. He tells how he reached the solution and you see right away that the same principles can be applied in your business.

Or perhaps in the advertising pages of COTTON you read a to-the-point message that a certain machine is doing the very thing that you want done—handling work more economically or turning out a superior product. And when you can do either of those things you can tackle the question of getting more business with more assurance. In either case everything is soon all right again—the threatened danger does not overtake you.

Of course you solve some of your problems—but not all of them. So does the other fellow in the cotton manufacturing industry—but he does not solve all of them. No one man can think of everything and so the profitable solutions of problems must be exchanged. But few business men have the time to travel from plant to plant until they find the one that has solved their particular problem. Therefore, COTTON's editorial department is organized to act as an efficient clearing house of the latest, best and most profitable methods in the industry.

COTTON's advertisers, too, help in this. They must sell equipment that does work better if they are to profit. So they have men in the field studying the problems of cotton manufacturers. When improved machinery is made as the result of this field-work you are informed through the manufacturers' advertisements.

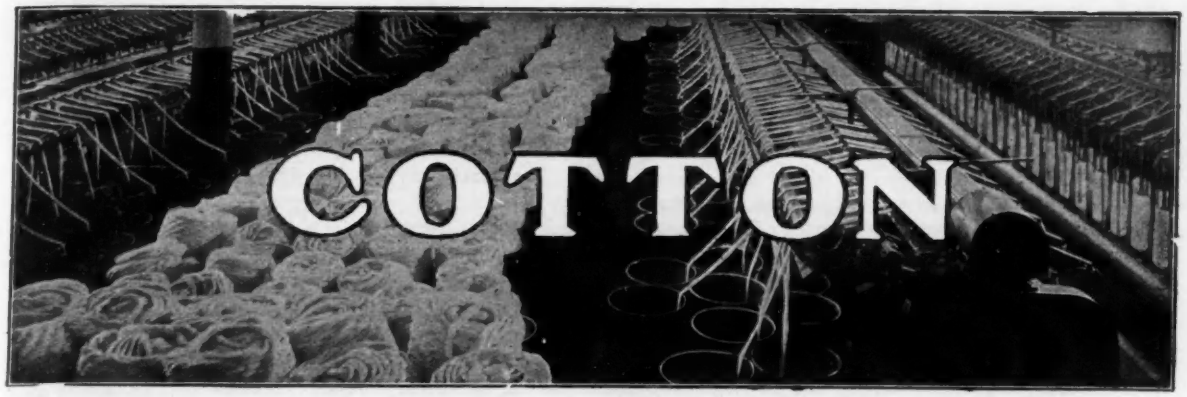
Thus the regular coming of COTTON frequently serves to end the chase of some of the hobgoblins of industry.

AMONG COTTON'S READERS

GEORGE S. HARRIS,
President and Manager Exposition Cotton Mills,
Atlanta, Ga.

"My observation leads me to say to you that your publication, COTTON, has certainly been in the past and is now a valuable adjunct to the cotton manufacturing industries in the South."

Geo. S. Harris



August, Nineteen-Twenty-One

While the Country Watches—and Prays.

Every week or so the news comes from Washington that new efforts are to be made to speed up tax and tariff legislation. Ever since the Republican party achieved its victory at last Fall's election, its leaders promised that Congress would make the problems of taxation and tariff its first consideration. President Harding emphasized this in his inaugural address and called Congress into special session to carry out the pledge.

Now almost five months have rolled off the calendar since the new administration went to work and the tax and tariff revision laws are still far from completion. Yet it would not be fair to criticize either the President or the Congress for this long delay. Both the tax problem and that of tariff revision presented complicated difficulties entangled in a mesh of economic politics and international considerations. The tariff bill alone includes a trifle of something like seven thousand items each important to some industry and vital to the prosperity of some locality. Each demand is entitled to careful consideration. The task of according to each of these their proper scale of duties is one in which no committee or subcommittee can cut across lots to a safe and accurate result.

The trouble came in the undue optimism of some of the leaders who promised that this herculean task would be accomplished before the pleasant months of Spring at Washington had slipped away into the torrid months of Summer. There were plenty of pessimistic warnings that these expectations of high speed would not be realized. But having promised speed, the leaders kept on promising. Nor did they learn from every new delay that there were still further delays in prospect.

Even now it will be well to discount liberally any promise that comes from Washington of the early passage of either tax or tariff bill. Even the passage of the measures by the House of Representatives carries with it no earnest of speedy consummation. Your Senate is ever a sore delayer of tariff bills. Things that look plain and uncomplicated, suddenly assume a strange terror of menacing mystery when the Senatorial minds get to work. The rules of the Senate also are not conducive to hasty action. Despite the unwieldy size of the House of Representatives, its rules make it possible to whip through whatever the majority wants with a minimum of delay. A two-thirds majority in the House is a tyrant no opposition can resist. There is a lot of noise in the doing, but it is finally and quickly done.

The Senate may make less noise. But it takes much longer to get somewhere. As a heritage of the feverish pre-war days, the Senate has a cloture rule that gives the majority a little more than its ancient power. But even with that, a measure such as the tariff bill can consume endless days of oratory and parliamentary procedure. Even the Senate Finance Committee can spend long and weary weeks inspecting the nooks and corners of the house bill, pulling out a timber here and shoving in a new plank there, mitering some new angle into a unsatisfactory stick, mortising and dovetailing and rebuilding until it is a wise carpenter that can recognize his own work. It is sometimes wise that this is the method adopted.

That is why the Fordney tariff bill, acclaimed with such vociferation in the House, looks out of all semblance to its original paternity and bobs up anew as a hybrid thing to be labelled—when it finally gets to the signature of the President—as the Fordney-Penrose Tariff Act of 1921.

There has been a great and growing pressure from all portions of the country to push the tax reform bill ahead of the tariff measure. For a time it looked as though this demand would receive a hearing. For even the White House seemed to agree that repeal of the excess profits tax and the rewriting of the various internal revenue tax schedules should take precedence over the rewriting of the tariff law. But the Ways and Means Committee of the House of Representatives vetoed this plan. Under the Constitution, all tax and tariff measures must originate in the House of Representatives. The mere fact that the Senate preferred to handle the tax bill first seemed only to strengthen the opposition in the House.

The House leaders, however, promised to send the tax bill along to the Senate as soon as possible after they had whipped the tariff bill into shape. In the Senate, both bills lie within the jurisdiction of the Senate Finance Committee. The latter held its hearings on the tax problem early in the spring. There is, therefore, no reason that the Senate committee should not give precedence to the tax bill and attempt to secure its Senatorial adoption before the vote is taken on the tariff bill in the upper house.

This will be the most likely as the two Houses are considered more in accord on the taxation question than they are on the tariff. Besides, the Senate committee plans to hold considerable hearings on the various tariff schedules.

All this takes time. Especially does it consume valuable days when the Washington sun gets in its hardest licks and the capitol swelters under tropical humidity. Congressmen are but human. Even Senators are not heroes. When the thermometer reaches a merry 106 in the shade, it takes more than a mere Congressional devotion to duty to keep the wilted laborers at their task.

All the pressure from the country can not alter this. All the demands that are being sent to Washington for speedier action on these important measures but serve to increase the heat. Out of the dispatches that come from Washington you can pick any prophecy you please concerning the dates upon which the new tax and tariff bills will be finally written into law. But it seems likely that little may be expected before the end of September and the brown leaves of October may have started to fall before President Harding puts his name on these long-awaited measures.

The Question of Federal Taxation.

Business is vitally concerned in taxation.

The present tax laws are obscure in phrasing and unsatisfactory in the results obtained. For example, a treasury field agent recently ruled that renewing the shingles on the roofs of mill village houses is a permanent investment, while renewing the weather boarding on the same houses comes under the head of repairs.

The remedy is for business men to devote more time to prospective tax laws before they are passed, communicating their thoughts and findings to their representatives and senators, to the end that after the passage of such laws less time and effort will be necessary to make them work and their working will not be disturbing to the business taxed.

Four bills which amend the revenue law so as to relieve industry of $1,730,000,000 annually in taxation, and transfer this to the owners of unused land and the inheritors of vast fortunes were introduced in Congress recently by Representative Oscar E. Keller, of Minnesota. The bills are sponsored by the Committee of Manufacturers and Merchants on Federal Taxation of which Otto Cullman of Chicago is chairman and which has a membership of more than 31,000 substantial business firms in all parts of the United States.

The first bill repeals all existing transportation stamp and sales taxes except those on tobacco, distilled spirits, oleomargarine, habit forming drugs and products of child labor. The bill also repeals the excess profits tax and the 10 per cent tax on the income of corporations.

The second bill amends the income tax so as to distinguish between "earned" and "unearned" income. The present rates on "unearned" income together with the super-taxes are retained, but the tax on "earned" incomes is cut in two. "Earned" income is defined as income derived from personal services or from business personally conducted. "Unearned" income is defined as income derived from rents of land or other property, interest on mortgages, notes or bonds, dividends on shares of stock whether in the form of money or stock dividends, and from any source other than the labor, skill or business or industry personally conducted of the person receiving the income.

The third bill amends the inheritance tax. Beginning with estates of $20,000 to $35,000 there is a tax of one per cent; $35,000 to $50,000 two per cent; $50,000 to $150,000 four per cent; $150,000 to $250,000 six per cent. The tax then graduates in an increasing scale until the point of $100,000,000 is reached after which the tax is 90 per cent.

The fourth bill provides for a tax of one percent on land values in excess of $10,000, after exempting buildings and improvements, and in the case of farms, cost of clearing, draining and maintenance of fertility. This bill aims to tax monopoly owners of natural resources, valuable 'sites' in cities and the holding of land out of use. The exemptions are so applied to farms as to exempt from taxation, according to Mr. Keller's estimate, approximately 98 per cent of all actual farmers. Owners of city homes also would be exempt from taxation under the proposed law.

"Business has been taxed into a state of stagnation," says Congressman Keller in explaining his bills, "and the problem of getting industry back on a firm footing is mainly the problem of collecting our national budget without so burdening business that it is unable to produce effectively. Secretary of the Treasury Mellon recognized this fact, in his letter to Chairman Fordney of the House ways and means committee, as he advocated the repeal of the excess profits tax and deplored the tax on transportation, although he saw no way of avoiding this.

"My program calls for the repeal of both these taxes, and also for the corporation income tax and all the so-called 'nuisance' taxes. These taxes usually are passed on to the consumer. Investigations by the Department of Justice reveal that they have added 22 per cent to the cost of the average commodity. This tax inflation is largely responsible for the so-called 'buyers' strike'. When not passed on, these taxes rest with paralyzing effect upon industry.

"Repeal of the nuisance taxes relieve producing business of $810,000,000 annually in taxation and repeal of the excess profits and corporation income tax will lift $925,000,000 more. We propose to raise this sum by taxing inheritances and land values. The inheritance tax will raise between $550,000,000 and $800,000,000 annually and the one per cent tax on land values will raise about $960,000,000.

"There is no valid reason why the inheritance tax should not be increased and the exemption lowered. A tax on inheritance is not a tax upon industry and does not have an injurious effect upon business. Instead, it actually will increase business and add more capital for productive purposes by taking and diffusing in commercial channels money which otherwise would be held by individuals or trusteeships, generally in the form of tax exempt securities. According to Secretary of the Treasury Mellon there is ten billion dollars invested in tax exempt securities and most of this amount can be reached in no other way except through an inheritance tax. One of my bills repeals the corporation income tax and another reduces by one-half the rates on 'earned' income, so that the inheritance tax in effect is a deferred income tax to be collected at a point where evasion is impossible and where the amount of the levy cannot check production or retard legitimate investment. This tax is economically sound and ethically it cannot be assailed.

"The tax on land values, after deducting improvements and allowing an exemption of $10,000, would not fall upon

small business concerns, home owners or producing farmers. The bulk of the billion dollars raised annually by this tax would come from owners of city 'sites', untilled agricultural land and unused or undeveloped natural resources. Instead of checking industry it actually would promote production.

"Its first effect would be to increase the nation's purchasing power. Our present excess profits, income and nuisance taxes are passed off upon the public in the form of higher prices. If these indirect taxes were repealed the average American family would have between $250 and $500 more to spend each year. Any business man can see that this huge sum of five or six billion dollars added to the annual volume of trade would materially benefit all lines of industry.

"The second immediate effect would be to reduce unemployment, and thus swell purchasing power. Vacant city lots pay the same tax as lots on which there are buildings. This would compel owners to improve their property or to sell it. This would speedily remedy the housing situation, boom the building and household supply trades, and provide employment for hundreds of thousands now idle. The same stimulation would result in the country. Speculators who hold land out of use would be forced to till it or to sell it at reasonable prices to those who would farm it. This would increase production, furnish work for more idle men and still further add to the nation's purchasing power.

"The third immediate effect of the land values tax would be to reduce rents, both of offices and residences. High rent is one of the principal reasons for our business depression. Rents continue to advance while everything else falls. Samuel Untermeyer brought out in his investigation of the New York building situation that rents had increased from 100 to 400 per cent in the past five years. Excessive rents are swallowing the profits of many business concerns.

"New York City, last winter, passed a law exempting housing improvements from taxation. The result has been to more than double the building permits in the six weeks' period that this act has been in operation. Rents have been reduced, there is a renewed market for building material, furniture and household goods, men are given employment and every line of business is boomed. If this exemption has had such a remarkable effect in New York City in so short a time, its extension over the whole nation undoubtedly would act as a tonic upon our entire business system.

"We are facing acute, world-wide competition for commercial supremacy, and the United States cannot hold the foreign markets it won during the war, nor meet European rivalry at home, if we enter this race wearing the shackles which excessive taxation upon industry imposes," concludes Congressman Keller. "It is absolutely essential that as much as possible of this burden be transferred from productive sources of wealth to those which are non-productive. In no other way can our nation hold up its end in the world struggle for trade.

"It also is necessary to do this in order to readjust our own serious domestic problems. There is unemployment throughout the land, and farm production is seriously curtailed. Both of these grave evils would be abated to an appreciable extent by the adoption of this tax program."

In presenting the foregoing outline of these four bills, we have devoted considerable space to explanations and comments by Congressman Keller so that the readers of COTTON will be able to thoroughly understand his viewpoint.

But the only way to get results for or against these or any other bills is for manufacturers to write their Congressman and express their desires. Take an interest in the question now. It takes no more mental effort and it's far more satisfactory than cussing after the wrong bill is signed by the President and in force.

In an earnest effort to find means of hastening the restoration of world commerce, business men of eleven nations held a meeting recently in London. This conference was the first annual meeting of the International Chamber of Commerce which was organized in Paris last summer. Some of the country's best known business men are giving their active attention and support to this organization and among the 200 American delegates attending the meeting from the textile end were such well known men as Rogers W. Davis, southern agent, Saco-Lowell Shops, Charlotte, N. C.; Albert Greene Duncan, treasurer, Harmony Mills, Cohoes, N. Y.; W. Irving Bullard, treasurer, National Association of Cotton Manufacturers, Boston, Mass.; Leopold S. Bache, president, New York Cotton Exchange, New York City; F. S. Blanchard, Pacific Mills, Boston, Mass.; N. H. Burt, Loveman & Burt Cotton Company, Gadsden, Ala.; and W. M. MacFarlane, president, Wm. Anderson Textile Mfg. Co., New York City.

An ordinary loose pulley running on a plain shaft recently caused a loss of $687.32. This particular loose pulley was on a fan shaft; the fan drawing the dust from two nappers in a cotton mill and blowing it into a dust room. The loose pulley, it will be noted, was not equipped with a bushing of the frictionless ball or roller type—hence, sooner or later, there was bound to be a fire. There was, and somebody paid for it.

Wouldn't loose pulleys be a good place to start on that waste reduction program?

W. Jett Lauck, railroad labor's "smoke screen," seems to have temporarily retired from the front pages of the newspapers. Also, as the smoke clears away, some real facts are beginning to be seen. Let us hope the wind doesn't change.

The State Senate of Georgia has a member by the name of Golucke. His given name may be Happy, which is more than can be said of the tax-payers of the State if his tax bill goes through.

A mill man is quoted as saying that since installing ball bearings on the aprons of the pickers at his mill he had lost only 27 laps out of 3,000 by actual count. What are the experience figures at your mill?

He who makes no mistakes, does nothing; he who makes too many, loses his job.

In all your getting, get wisdom.

Popular Textile Chemistry

BY JAMES A. BRANEGAN.

PRESIDENT KALI MANUFACTURING CO., PHILADELPHIA.

Sulphide of Soda.

Sulphur dyes are coming more in vogue every year particularly in the hosiery line and when these dyes are used Sulphide of Soda is used with them. The dyer may vary the other chemicals used, he may use Common Salt instead of Glauber Salt or he may use Phosphate of Soda, but in any case he must use Sulphide of Soda with sulphur colors.

Sulphide of Soda as used in the dye-house is a brown or reddish salt, alkaline in action, has an odor somewhat similar to rotten eggs and is soluble in water. The color mentioned is due to impurities which are usually iron or coal and it will surprise most people to know that pure Sulphide of Soda is white.

Sulphide of Soda comes on the market in three forms: solid in sheet iron drums like Caustic Soda, broken or chipped in barrels or drums, and crystal in barrels. The broken, chipped and solid all have approximately the same strength which is 60 per cent to 62 per cent and in the trade this is known as "double strength." The crystal contains 30 per cent to 31 per cent of Sulphide of Soda and is known as "single strength," the difference between the two is the water of crystallization and as crystallization is always a purification the single strength is more pure than the double strength. This difference in purity, however, between the two grades is slight and usually ignored, and is mentioned here in order to settle a question which frequently comes up in the mind of the consumer.

As its name indicates Sulphide of Soda is a compound of Soda and Sulphur and in chemistry we express this as Na_2S. The chemical name for Sodium is "Natrium," and its symbol is "Na." The chemical name of Sulphur is the same as its every-day name and its symbol is "S." The little figure "2" after the Na means two parts (atoms) and as we never in chemistry put the figure "1" after a symbol the absence of any figure indicates one part (one atom). From this the chemist realizes at a glance that Na_2S is composed of 2 atoms of Sodium and 1 atom of Sulphur. By weight the proportions are much different being 46 parts of Sodium to 32 parts of Sulphur. In chemistry, however, the symbolical formula always expresses atoms and an atom is the smallest part in which any element can be divided.

In order to understand the process of manufacturing Sulphide of Soda (Sodium Sulphide) it will be necessary to use more chemical symbols. In the manufacture of Muriatic Acid we get a residue known as Salt Cake and this Salt Cake is expressed as Na_2SO_4 meaning 2 parts Sodium, 1 part Sulphur and 4 parts Oxygen (note the difference between this and Sulphide of Soda, and also note the symbol for Oxygen is O). Coal (coke and charcoal) is mostly Carbon and the chemical symbol for Carbon is "C." Now when Carbon or Coal is heated to redness and supplied with air it combines with Oxygen in the air forming CO_2 (Carbon dioxide gas), meaning 1 part carbon and 2 parts Oxygen, and when this Oxygen is supplied from the atmosphere as in a stove, heater, etc., we call this burning. But suppose we put the coal in an airtight oven and with a fire underneath heat it to redness, will it burn? It will not, for the simple reason there is no Oxygen present with which it can combine. But Coal (Carbon) heated in an oven without air has the power to pull oxygen from any substance with which it may be mixed and combine with the oxygen forming Carbon dioxide gas (CO_2) exactly the same gas mentioned above and leaving the substance with which it was mixed free from the Oxygen the substance contained originally, and free from the Coal with which the substance was mixed. This reaction is known in chemistry as "reduction" and is the procedure which the manufacturer of Sodium Sulphide follows.

The salt cake (Na_2SO_4) is mixed with powdered coal (C), and placed in a closed retort and heated to redness from below. The coal robs the salt cake of its oxygen leaving Sodium Sulphide, and as it takes two atoms of Carbon (Coal) to reduce one complete molecule of salt cake we express the whole reaction in chemical terms as follows:

$$Na_2SO_4 + 2C = Na_2S + CO_2CO_2$$

(Salt cake) + (Coal) = (Sodium Sulphide) + Carbon Dioxide) or $2CO_2$

as correctly written. The large 2 before CO_2 meaning two complete molecules of CO_2.

When the reduction is complete the mass is dissolved in water and concentrated to form the double strength or allowed to stand and crystallize to form the single strength.

Sulphide of Soda is a very active salt having a corrosive action on most metals (monel metal appears to stand it best) and throws most elements out of solution, for which reason it is frequently used in chemical analysis. It is also used in copper refining, wool pulling, and coloring metals such as silver, brass, etc. In the dyehouse the sulphide acts quickly on the dyestuff and also to some extent on the cotton itself and it is this activity which frequently gives the dyed hosiery a reddish or bronzy look. At times, in a standing bath, an excess of Sulphide of Soda accumulates and this excess is always harmful, as it tends to make the dye too soluble. To prevent this excess of Sulphide of Soda the bath should be tested at regular intervals and corrected to a standard condition. The writer was one of the first to introduce the use of Sulphide of Soda in this country and knowing its nature and peculiarities, worked for years to perfect a finishing oil which would act as a developer and change the reddish or bronzy cast on black dyed goods to a rich black and at the same time act as a softener. An oil of this character is now on the market and this oil when used on hosiery or other black dyed goods evens up and develops a deep rich black and furthermore gives the goods the soft feel so much desired, no other softener or soap being required.

[This is the first of a series of articles covering the chemicals in general use around the dyehouse. Others will appear in later issues.]

If a thing's not worth fighting for, it's not worth fighting about.

World Changes in Production and Markets

BY HERBERT HOOVER.

SECRETARY OF COMMERCE.

There is a feeling of some uneasiness and even of pessimism regarding the future of our foreign trade, in which I do not participate.

Our exports and imports during the last few months have dropped nearly 50 per cent in value from the high water mark of a year ago. Some of this decrease is due to the fall in prices relatively more than volume; some of it to the temporary world depression and some of it lies deeper.

In these times of troubled minds, we find much conflict of opinion as to the situation and its remedies. Some extreme groups insist that inasmuch as our exports comprise but 10 per cent of our total production, therefore our foreign trade bears only this ratio to our economic life, and that consequently our true course is to forget it and devote ourselves to healing our internal economic wounds. Other extreme groups consider that for our internal situation the only remedy is restoration of our export trade and they would undertake desperate measures to accomplish it. In either case we must not allow the present extreme industrial depression to obscure our view. We have passed through several depressions since the Civil War and we have already turned the corner of this one.

The importance of our foreign trade requires but little defense. I may say in passing that our whole standard of living greatly depends upon our imports and that our exports are the great balance wheel for our production. Exports are vital to the stabilization of our industries, of price levels, of wages, and of employment. While our exports do cover but a small per cent of our total production, on the other hand they do comprise a large percentage of the production of certain industries. For instance, we generally export 20 per cent of our wheat, 60 per cent of our cotton, 75 per cent of our copper, not to mention others. Unless we find a market for the surplus production of our great industries, we shall continue to keep some 25 millions of our people in reduced buying power. We might even drive them into poverty—during the many years that would be required to shift the whole basis of our internal production. Nor does a nation become rich by its exports alone—but by its trade.

While many of the causes of the present depression lie within our own borders, yet there may be no recovery from these hard times for many years to come, if we neglect our economic relations abroad. Even if we lower our vision of civilization in this crisis solely to our own selfish economic interest, we are yet mightily concerned in the recuperation of the entire world. The hard times that knock at every cottage door today came from Europe. No tariffs, no embargoes, no navies, no armies can ever defend us from these invasions. Our sole defense is the prosperity of our neighbors and our own commercial skill. The recovery of our foreign trade can march only in company with the welfare and prosperity of our customers.

When we analyze the present foreign trade situation we find tremendous shifts in economic currents since 1914. Indeed, we find great changes still in progress. If we would guide our policies of production and of trade aright, we must keep these great changes constantly in mind. These profound alterations naturally fall into two divisions: The shift in the world's production and markets and the shift in the world's financial relations. They bear upon each other, and they affect our three primary groups of food, raw material, and manufactured goods differently.

The United States.

There have been great changes in our own economic situation. We have not alone shifted from a debtor to a creditor nation. Our capacity for surplus production in food and manufactures has grown enormously during the war until we have taken front rank of the world in foreign trade.

The direction of our trade has shifted greatly. During the last year about one-half of our whole foreign trade was with Europe, but of our exports to them 80 per cent were foodstuffs and raw material; of our exports to states outside of Europe about 75 per cent were manufactured goods. Europe in turn is our serious competitor in the marketing of our manufactured goods to the rest of the world. We have enormously increased our imports of tropical and other commodities that we do not produce.

The Noncombatant Countries.

Since the Great War began, the world outside the fighting states of Europe has gained mightily in wealth, in standards of living, and in consuming power. Even omitting the United States, it has gained something like forty millions in population. The countries not directly affected by the war are indeed suffering from the general depression, but this depression with them is only the aftermath of the malevolent forces born of the past war booms. They have none of the deep economic wounds of the fighting states, and they will be quick to recover. During the war the productive capacity of these states, except possibly Japan, had no unusual increase because of their isolation through shortage of shipping.

Russia.

One of the economic shifts that affects the whole world profoundly is from Russia. Russia bore much the same relation to western Europe before the war that the Mississippi Valley bears to our Northeastern States. Russia was one of the great food bases of the manufacturing countries of western Europe, exchanging food for their fabricated products. These manufactured goods in turn were to some degree produced from our raw materials. Even at best it will be many years before Russia will have recovered. We are today the only source of enlarged food production. Europe must and will draw from us a great proportion of food supplies that she formerly drew from Russia. I see no basic reason why we should not continue to export approximately the same large volume of foodstuffs that we have shipped abroad during the past 12 months. This item alone at even present prices would be triple our pre-war food exports, and would represent the equal of more than 60 per cent of our whole pre-war export trade.

An address before the National Shoe and Leather Exposition, Boston, Mass.

Germany.

Another great but uncertain shift in world forces will arise out of Germany. The reparation payments must have a profound effect upon the whole economy of the world. Germany is to pay outside her borders to the Allies $500,000,000, plus 26 per cent export duty, or, say, a minimum of about $750,000,000 per annum. Germany is left without much gold, foreign property, or foreign business earnings of consequence; therefore, these payments must be made mostly by the sale of manufactured goods outside her borders. But beyond the reparation payments, she must also sell goods abroad in the amounts necessary to buy her imports of food and raw materials. Any calculation based on the pre-war trade of Germany implies an enormous increase—perhaps more than doubling—of her pre-war exports. In view of the export duty and other payments, she must produce these goods for about one-half our production cost in order to take our markets. Such an increase in exports must be manufactured goods, and until the world consumption grows, these must be marketed in displacement of the goods of other industrial nations. We shall certainly feel the effects of this flow of goods that must be produced if she is to make reparation payments. On the other hand, Germany must take more raw materials from us for this purpose. In any event, the crowding in the market of German exports will affect her immediate neighbors more than ourselves, for 80 per cent of her market, pre-war as well as in the future, must lie in Europe itself.

Other Changes Among Combatant States.

The economic changes in the other combatant states in Europe obviously affects us also. The economic wounds given to them all by the war and peace will be long in healing. The sacrifice of skilled labor, of brains, and of property will require a generation to cure. The hates of many newly liberated states must cool slowly, and their many new borders check the free flow of commerce. Many of these states possess masses of people who have suffered from exploitation and tyranny for generations. Their extreme reactions of Bolshevism and socialism and nationalization are slowly dying out. Many governments have been unable to raise sufficient taxes to meet expenditures, and the ceaseless printing of currency carries destructive inflation. All of them except the enemy states bear the burden of greater military establishments than even before the Great War. All this must accumulate to decrease their productive power and to lower their standards of living.

In balance against this loss of productive power, their people over great sections are now coming to a full realization that they must work harder than ever before and that they must export commodities for all that is in them, in order that they may make exchanges for the bare margin of life. They will some of them receive payments from Germany in relief of their tax burdens. They are mobilizing the skill and the intelligence of their people to their economic salvation with the same diligence that they were mobilized in war. The great manufacturing states are straining every device of science and thought to the improvement of their industrial processes, to the simplification of products, to the elimination of waste—that they shall make every reduction in production costs. In reinforcement of their marketing machinery, many of the governments are stimulating the consolidation of banks and of manufacturing concerns. Governmental and government encouraged combinations are being created to control exports and imports to exploit foreign markets. They are seeking special concessions for development and trade throughout the world. Altogether these policies comprise a militancy in commercial expansion that compare with Elizabethan England.

The Effect Upon Us.

Any improvement in European production of manufactured goods will favorably affect our market for those raw materials such as cotton and copper, where we possess the final supplies. In considering the demands for such raw materials, we must remember that the manufacturing countries of western Europe have lost for a long time to come any great markets in Russia and Turkey; the population of Europe as a whole has not the consuming capacity for manufactured goods that it had before the war and, therefore, we must expect a less than pre-war consumption in the confines of Europe for their remanufactures of our raw materials. But on the other hand, they will find after this depression is passed that the markets of the rest of the world are larger than before the war. I am confident they will gradually return to pre-war demand for our cotton, copper, etc. Fortunately, our producers have realized this temporary situation and have vigorously reduced their production so that they should eventually realize better prices than at present.

It seems to me that it was inevitable that the balance of the forces at work in Europe would improve their ability in competitive manufactured goods. Their production costs were bound to be low, both by better organized industry and by lowered standards of living. Some of them are today through government subsidies, artificially low and will undoubtedly increase. If we analyze the effect of these forces on the market for our manufactured goods, either in Europe or in our much larger market outside of Europe, we quickly find two directions in which we occupy a position of some security. The first is in those exports of lower production costs, which are the result of great repetitive production, which has its firm root in our enormous consumption. The second is in that large number of special manufactures in which the inventive genius and skill of our people have been developed beyond any country in the world. I believe we will recover and can hold our share of the market for these products after the present world depression.

As to our manufactures containing a large element of labor cost, in which we do not enjoy special advantages, we must look out and take measures of our own. We can no doubt devise tariff measures that will protect our domestic market. But if we are to hold to our foreign markets in this vast group of our manufactures, and thus do keep our people employed, we have several things to attend to. Fundamentally, we must get our production costs down. That lies only along the road of increased efficiency in our whole industrial machine. It means a willingness of our working people to put forth every effort that is in them consistent with health, proper family life, and good citizenship. The surest road to a continued high wage, and the surest safeguard against unemployment is to remove every restriction on effort. This must extend from our mines to the railways, to the factories, to the wharf, and to the ship. It means smaller margins of profit. It means

that ultimately we must have much lower transportation rates. It means we must have better organized marketing machinery abroad under Americans themselves. It means the establishment of adequate short time credit machinery and much more care in foreign credit risks than our merchants have shown in the last 12 months. It means elimination of the great wastes in industry. For instance, in the Atlantic seaboard area alone, by the development of these great water powers and through economies by electrification generally, we could profitably save 30,000,000 tons of coal per annum if we had the courage to go at it. It means the Government must remove as quickly as possible those unnecessary domestic burdens upon commerce to which the Government is a party, by the reorganization of our tax system, the settlement of the tariff question, the reduction in Government expenditure through the reorganization of the Federal Government, through reduction of armament and through reduction of Shipping Board losses and by the settlement by the Government of the outstanding claims of our railways. It means we must cease trying to drive American ship owners off the sea with tax-paid shipping losses. We must carefully determine what particular trade routes we will maintain in development of our commerce over a period of years, and let our merchants know them. It means the Government must provide such information to commerce and industry, from both at home and abroad, as will enlarge its judgment. It means we must extend scientific research into the problems of waste, the perfection of processes, the simplification of methods that are beyond the ability of one manufacturer acting alone, and we must cooperate with industry to perfect these things. I am confident we can hold our markets, our higher standards of living and of wage if we all put our backs into it.

The Shift in Credits.

Overriding all these questions of production and markets is one of credits. Our whole financial relation to the rest of the world has greatly shifted. From a nation owing some five billions of dollars to the rest of the world for moneys borrowed, the war has reversed our position so that the world, principally Europe, owes us today from thirteen to fifteen billions of dollars, of which about ten billions is due our Government. Before the war we had to export a surplus over our imports, and beyond this had to contribute through remittances of immigrants, tourists, shipping, etc., great sums to pay interest upon our debts.

The reason for the piling up of this vast debt is, of course, that we have not only loaned money to the allies but the war vastly increased the surplus of our exports, and the movement still continues to accumulate in our favor. Unless we would cease a large part of our war increased productivity with all the resulting unemployment and losses of such a cessation, we must continue for some time to export in excess of our imports. Eventually the increase in our imports of tropical supplies, minerals and commodities that we do not ourselves produce, together with the spending of tourists and the investment of surplus capital abroad, etc., should overtake our export balance and establish a proper equilibrium. In the meantime, if we would maintain our economic position, we must contnue to give credits to buyers of our goods and if we should demand interest or principal on our established loans we would nullify any benefits of such credits. I may repeat that if today we stop giving more credits and demand payment of interest on debts due our Government, our exports will further decline, and the decline will find its interpretation in more unemployment among our own people and more displacement of our industries.

The natural effect of our continued surplus of exports (although we have as yet made no demand for payment of interest on the Government debt), is that our dollar is at a premium over even the most stable currencies in the world. Thus the cost of producing our commodities is higher than in any other country. This does not so materially affect the export of those commodities of which we hold a final supply, such as the food supplies and our raw materials, or those articles in the manufacture of which we have unique ability. It does, however, partly blockade our exports of manufactured goods in which we directly compete with Europe. Exchange itself is not the cause but the effect. It bears the same relation to trade that the barometer does to the weather. It is but an indication of the movement of commodities and credit. Our high barometer means we need more credits outward or alternative we must send less goods out or take more goods in.

I may say in passing that I am confident that our debtors can eventually carry the debt due to us with ease, provided they have the time necessary for the healing of their economic wounds, that they succeed in the reorganization of their fiscal policies so as to balance their government expenditure, and above all, that they secure disarmament and continued peace. Before the war the world carried a debt to a single European nation of twice the size of our foreign claims without knowing it, and with the renewed growth of the world's commerce and wealth our debt will be no burden. Our problem is the difficulties of our debtors during the few years until these blessings are attained.

All of my rightful and optimistic view that we will maintain the flow of our goods is based upon the assumption that we can wisely manage these credit problems. There is a general agreement that we must extend credit if we would market our surplus and upbuild our customers during these next few years of readjustment, but as to the methods there are many minds; there are those who would directly try to stabilize exchange back to parity; those who would create securities jointly guaranteed by the principal nations, either through international banks of issue, bonds or currency; those who would extend credits directly or indirectly from the United States Treasury to buyers of goods, in order to stimulate exports; and also those who have confidence that the processes of business will find their own way out.

Attempts to bring exchange to parity or to create international securities of any kind are open to the objection that they involve an element of inflation and that they practically open the gates of credit from the United States without regard to risk, how its purpose affects us or whether it really benefits the borrower. Loans from our Government direct to foreign governments or foreign merchants have a hundred objections and disagreeable entanglements which we learned well enough during the war. In all this maze of difficulty and the unsettlement over credits and debts, I would sum up that wisdom consists in knowing what to do next rather than debates upon perfection.

As necessary as the continued establishment of foreign credits are, if we are to maintain our large volume of export trade, we should not over-estimate the amount needed

for legitimate trade for refinance and for reconstruction purposes. The amount is not so great as popularly supposed and will annually decline. I believe all trading states of consequence in the world can even now finance their imports of food supplies. The stronger of them can finance their imports of raw materials. We are, indeed, importing very much larger quantities of tropical produce than before the war and our own consumption of these commodities will continue to grow. The margin of credits needed beyond our imports in order to keep commerce alive for the present are, first, comparatively short term amounts to cover part of our exports of raw materials and the distribution period of our manufactured goods and, second, constant refinance of debts or interest already owed to us.

In summary, on the production and marketing side of our commerce, we can say that our food exports should remain on a greatly enlarged scale; that the demand for our raw materials should slowly increase toward pre-war amounts; that in respect to our manufactures we should be able to hold special fields of repetitive production and ingenuity; that we will need to make a fight to hold the markets for manufactured goods where we come more directly into competition with the European manufacturer, but that we can do it if we will work and apply our brains to it. On the financial side of our situation, I do not believe our world credit situation is at all so unsurmountable or that it requires extraordinary solutions.

I may repeat that we need to realize above all things, that even if we lower our vision of civilization in this crisis solely to that of our own selfish economic interest, we are mightily concerned in the recuperation of the entire world. There is an economic interdependence in the world that recognizes no national boundaries. The greatest jeopardy to the standard of living of our people is the lowered standards of Europe. Now that we have become a great creditor nation, we must learn that this great debt must be wisely directed so that we do not stifle both our own growth and the growth of others.

There are, indeed, many complexities arising out of our great expansion on productive power and our suddenly born creditor position. I do not need say that we are confronted with a hundred difficulties, that we must be alert to steer our commercial policies against the winds of the world in an economic storm. We are suffering greatly in this immediate world-wide industrial depression. This depression is partly due to the war; it is partly due to our post-war boom, with its speculation, its extravagance, and its slackening of efficiency. The Government can help recovery by removing the obstructions to commerce and industry. But when all is done, the real cure for all depressions is courage and applied intelligence and the return to the primary virtues of hard, conscientious toil and economy in living. On every side there is evidence that the vast majority of our whole nation is making again an effort in those directions equalled only by that of 1918, and the day some months ago when we entered this effort we fundamentally turned the corner of this depression. While our recovery may be slower than some may expect, nothing can prevent the prosperity of a country where the people have enlightenment, wish to work, wish to produce, and wish to do right by their neighbors.

We are not a nation of machines, and houses, factories, and railways. We are a nation of men, women, and children. Our industrial system and our commerce are simply implements for their comfort and happiness. When we deal with those great problems of business and economics we must be inspired by the knowledge that we are increasing and defending the standards of living of all our people. Upon this soil grow those moral and intellectual forces that make our nation great.

Indecision—An Execration.

History is prone to dwell on the positive—negatives win but neglect. Thus that Circe who, since the world began, has weakened men with her tremulous beguilements, hides behind her seeming frailty and escapes her notorious due.

Egypt the Magnificent, drugging a lone Roman conqueror's ambitious manhood with a seductive pathognomy, is a scarlet byword.

Her Grace of DuBarry, with greedy eyes set on power and revenge, and bright, tight lips that trickled venomed honey in a Royal Ear, was the unwitting torchbearer of but one Revolution to become a sensuous synonym.

Nell Gwyn, the head of a wine-mad Stuart on her breast, might wreck a single dynasty and earn a deathless shame.

Yet between the scrawled lines of all the thousand pages that record human activity through the impatient years, runs the uncertain, weaving trail of the greatest Carmined Feline of them all—trembling destroyer of unnumbered empires and enterprises, weak despoiler of countless loves and lives—the slack-lipped slattern Indecision.

From the dim days when forgotten chieftains dallied with her, unresisting while Tamerlane marched his frenetic Tartars across southwestern Asia, she has laid the Curse of Tremor upon men's minds.

Even before, fabled Troy—secure, impregnable—fell to a myth while brave warriors heard her childish queries about the Monstrous Horse.

The last white Tsar, standing before a firing squad at Yekaterinberg, cursed the years of her domination.

She, Indecision, with soft hands loose stretched around a throne, has felt a Nation's pulses cease. Idling by a forge, her clinging kisses have stifled Industry.

She is still Indecision—perpetually young, everlastingly alluring, and still men, seeking ease, are beguiled to mate with her. Under the bar sinister of illegitimacy the offspring of those liaisons—Vacillation and Procrastination—grow and multiply on the strength sapped from men's wills. Even to a third and fourth generation the evil maternal lineage breaks through to spawn Indolence and Incompetence.

Indecision yet survives and thrives. She is the antithesis of action, the Nemesis of Progress. Her dupes learn to wait, to hesitate and to equivocate—and become at last Apostles of Enervation and Followers of Fear.—*The Dart.*

The National Aniline and Chemical Co., New York City, has issued a color card showing "Nacco" union and neutral colors; wool-and-silk colors; and wool colors. These colors are for garment dyeing. The card contains 52 colors. Dyeing instructions are given for each class of colors.

The World Cotton Conference

BY WILLIAM DAVIS, M. A.

The second World Cotton Conference opened in Liverpool, England, on Monday, June 13th, 1921, where the various meetings and functions took place in an area which allowed of the greatest centralization, access from one point to another of the meeting places being of the easiest description, the places being quite near each other.

The opening meeting at the Philharmonic Hall was of a very representative character, and over 600 were present when the Lord Mayor of Liverpool, Alderman E. Russel Taylor, gave the first address of welcome to the assembled delegates. In his speech the Lord Mayor gave a heartfelt welcome to the delegates, of whom it was mentioned that of about 250 accredited delegates, 150 were from the United States. Of this number they also had representatives from twelve different countries and much attention was given to the colored members of the Conference, as being something of a novelty at a gathering in England.

Following the Lord Mayor, Lieutenant Colonel Shute, president of the Liverpool Cotton Association, also expressed words of welcome to the delegates on behalf of the city. He stated that no one in Lancashire wished to receive the raw cotton at a price that meant suffering and hardship on the part of those who grew it, and that English spinners would be willing to pay the fullest price for cotton, but they were governed by economic laws which they could neither make nor unmake. He expressed it as his opinion that the exchange of ideas for the common good of all concerned would surely bring good results from the Conference.

Lord Emmott, the president of the World Cotton Conference, acknowledged the cordial terms in which the gathering had been greeted by the Lord Mayor and Lieutenant Colonel Shute, though, he said, it was unfortunate that the Conference should assemble at a time of depression and industrial disputes. However, he declared, beyond the effect these disputes would have upon the amenities of the occasion for those who had come from other countries, he was not going to apologize for them, inasmuch as England is not the only country that is troubled with such disputes, and that, after all, the nations who were in the recent war are necessarily rebuilding psychologically, if not materially, a new world upon the ashes of the old, which is likely to be a painful, prolonged and difficult process.

The speaker agreed with the gentleman who preceded him on the program that spinners are interested in helping the grower to secure a reasonable price for his cotton, and expressed the belief that if those interested in the production of cotton could produce convincing arguments to the effect that cotton was too cheap, and could build up in manufacturers and customers a practical faith on which action could be taken, then the Conference would do a great deal of good.

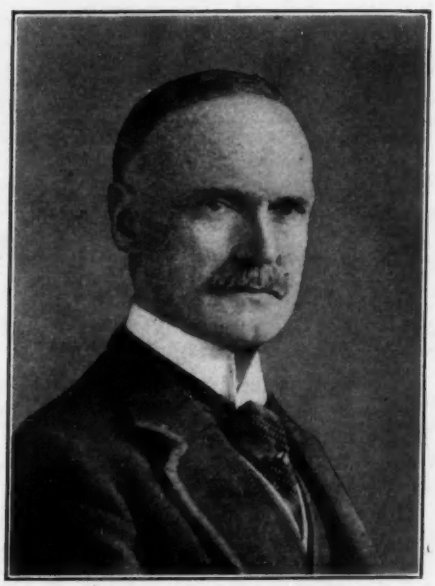
Hon. Richard I. Manning, ex-Governor of South Carolina, responded to the address of welcome on behalf of the American delegates, and expressed great pleasure in being in England. This feeling was enhanced, he declared, by the fact that Americans felt at home in a country which he regarded as the most beautiful in the world, and the fact that England and America fought side by side to suppress aggression and to save civilization for the world. Since the war has upset economic conditions in both countries, he said, it is now the duty of everyone to solve the new problems that have arisen.

The speaker declared that he would like to point out that the southern section of the United States—the cotton growing section—has come to realize that they can no longer allow the American cotton crop to be thrown recklessly on the markets in the three months immediately after it had been harvested. And, he declared, they feel that in the marketing, as in the growing, of their cotton, they must adopt methods more advanced and more scientific than those formerly employed, believing that such methods would prove more profitable.

The Second Session

was held on Monday afternoon, and David R. Coker, of Hartsville, South Carolina, read a paper on "How Can the Production of Cotton Best Be Increased?"

Mr. Coker said that it might seem somewhat academic to discuss means of improving the quality of American cotton



THE RIGHT HON. LORD EMMOTT, OF OLDHAM, WHO WAS RE-ELECTED PRESIDENT.

and keeping the supply adequate at a time when the world was over-supplied with almost all growths and types of cotton, and when the cotton producer saw no chance of realizing the cost of production out of the present and past year's crops. However, he stated, it must be assumed that world conditions will gradually return to normal, and that it seems inevitable that there will be a great increase in the demand for cotton fabrics as soon as the millions, now on the verge of famine, again secure a surplus beyond food requirements with which to clothe themselves.

The speaker stated that the subject assigned to him was a double one, but a study of the factors affecting the quality and the supply of the cotton crop showed that these factors were largely the same. In the great central

markets of the world cotton of good grade and staple always brought more than cotton of poor grade and staple, though the "differential" was variable. In the long run, he said, the supply of cotton would depend on the profitableness of the industry. Therefore, as supply depends on profit, which in turn depends on quality and yield, the problems of adequate supply and of improved quality are essentially the same.

Even with double the average production per acre, Mr. Coker pointed out, at present prices the landowner could not receive a fair return on his investment and supervision, and the cotton laborer would still be paid less than the workers in every other American industry. The world must be made to understand, said Mr. Coker, that in the past the South has been able to raise cotton at prices under 15 cents per pound only by paying wages hardly sufficient to maintain the average worker and his family in a condition of dire poverty, and that even at these returns the prices were insufficient to pay the landowner a fair return on his investment.

In the discussion which followed Mr. Coker's paper on this subject, he was asked if he could specify a price in cents per pound for cotton with which the southern farmer would be satisfied. He replied that under present conditions and prices, there is not a decent living in cotton production, that the margin of profit received was not sufficient to make improvements needed. He stated that he did not know what could be done to help the situation, but when prices rose, as he believed they would, he hoped that they would not reach the levels to which they ascended in the past year or the preceding year. He said that it was his opinion that the very high prices had done much damage, and that if he could fix a price for cotton, he would certainly not fix any price so high as those which have obtained in recent years.

R. I. Manning also expressed opinions on the subject, agreeing that it is an impossibility to state exactly the cost of producing cotton.

The next feature on the program was the reading of a paper on "Cotton Growing Within the British Empire" by W. B. Himbury, of the British Cotton Growing Association. In the course of this paper the experiments being made within the British Empire in connection with cotton growing were described, and the point made that before the war there was unquestionably a shortage of cotton. The spinning and manufacturing industries of the country had at times to close down, or work short time, said Mr. Himbury, and this of course brought serious consequences. Therefore, he pointed out, when the world settles down once more to work and the spindles of the world are again going, the shortage might again occur, and if it does, the manufacturers of Lancashire want to realize that there are other sources of supply. Therefore, it was pointed out, the growing of cotton in new fields—or not having all the eggs in one basket—should be of undoubted importance to the trade. Furthermore, it was declared improbable that insect pests or climatic conditions which might adversely affect the crop in one part of the world would be equally bad in another. The speaker indicated that he was satisfied that large quantities of cotton could be produced in the Empire, and those new fields which at present seem to give the greatest promise are Nigeria, the Sudan and Uganda. He predicted that the future Empire cotton zone would be between lines drawn about 15 degrees north of the Equator and 5 degrees south, embracing Northern Nigeria, the Sudan and Uganda.

Mr. Himbury stated that the British Government has made a grant of 1,000,000 pounds sterling, for developing the growing of cotton within the Empire, and these would be supplemented with a voluntary levy of 6 pence per bale by the spinners of Lancashire—the total to be applied by the Empire Cotton-Growing Corporation and the British Cotton-Growing Association in furthering the work.

There was some discussion following the reading of this paper. Colonel Shute said that but for the war, England would have probably been needing 18,000,000 bales of American cotton, while this year's estimate of the crop is about 7½ million bales. Therefore, he said, the fact that an effort was being made to develop cotton growing in different parts of the British Empire should appeal to the Americans as a very natural thing.

In reply to questions, Mr. Himbury said he thought the British Cotton-Growing Association could produce cotton and land it in Liverpool at six-pence a pound. This was based on a length of staple of from 1 1/16 to 1¼ inch, and on the use of native labor. It was pointed out that it was not all a question of wages, as the native was given the seed and was guaranteed a price for the cotton. Further, it must be remembered that the native gets his land free, has no heavy taxes, and is not under the supervision of a landlord.

Alderman Crapper pointed out that the cotton produced in the British Empire of which Mr. Himbury spoke was grown on a cooperative basis. A certain portion of the value of the crop goes to the Government for rent and irrigation, another portion to the grower, and another to the merchant and the ginner. The result has been that the poor Sudanese, who had previously scratched for their living, had received what seemed to them to be almost untold wealth.

Colonel Shute declared that the American delegates should realize that the growing of cotton in the British Empire was not of such weighty concern after all. The growers in the southern states need not be discouraged when they hear that Empire cotton could be sold at six-pence a pound, for cotton raised in Uganda and cotton grown in the States are fundamentally different propositions.

This discussion concluded the business session on Monday.

Notes and Impressions of the First Day.

The most interesting feature of the first day of the Conference was the way in which the different viewpoints on different subjects were presented, not only in the papers read, but chiefly in the discussions which followed those papers. In these notes it may be of interest to outline some of the psychological moments at the Conference.

On the opening day, Mr. Coker's paper was closely followed by those present, the subject being "How Can the Production of Cotton Best Be Increased?" and various representatives of the cotton growing and cotton consuming interests stated their case. The statement regarding economic conditions of the growing of cotton made a deep impression on those present. There was remarkable unanimity among those present that the price of cotton at present was much too low and it would be better for all concerned when an upward movement made itself evident in the market. Much interest was taken in the announcement

that the cotton grown by the British Cotton-Growing Association could be sold at six-pence a pound and that the labor was paid on the same basis as was granted to other work of the same character.

The chief social function of the first day of the Conference was the reception given to the delegates at the Town Hall of Liverpool, whence they were conveyed in special cars. The headquarters of the Conference and the residence of some of the American delegates was the Midland Adelphi Hotel, a hostelry built and run on distinctly American lines, and where the visitors felt completely at home.

Mr. Farrington, British representative of the Universal Winding Company, who has spent much time in America, assisted Frank Nasmith, the British secretary of the Conference, in his arduous duties. A number of the delegates preferred to stay at Southport, a fashionable watering place about 20 miles away on the coast.

The Second Day.

The second day of the Conference was begun with the third session on Tuesday morning, and the first paper to be presented was on "Universal Standards for American Cotton," by William R. Meadows, of the U. S. Department of Agriculture, Washington, D. C.

At the present time two sets of standards are observed: the one devised in the United States, and having the authorization of Government enactment; the other having the authentication of long years of observance in England. Mr. Meadows advocated the adoption of the United States standards, though he emphasized that this implied no criticism of other standards, but he argued that the establishment of American standards by the law of the United States gave them a peculiar force and value.

Mr. Meadows' paper created deep interest and the debate was eagerly taken up from both the English and the American sides. Mr. Meadows impressed his hearers with his obvious desire to be fair to both sides and it was clear that the lines of division between the British and American standards are not very great and a representative committee would soon succeed in bringing this over. Emphasis was laid on the necessity of revising the standards more frequently and renewing the samples as these lost their characteristics after a time. It was agreed that if the matter were reviewed every two years or so by British and American representative men acting in unison, the matter could be solved. Standards for cotton had to be reviewed from time to time as the crop improved or otherwise. A great deal was heard of the favorite British term "time-honored" which is so often the cloak for small progress. The standards of British buyers were locked away in the Bank of England, it was declared, and had been there for 27 years; a more frequent revision would be productive of much good.

"Financing American Cotton for European Use" was the title of a paper prepared by Willis H. Booth, vice-president of the Guaranty Trust Company, New York City, but read *in absentia* by J. A. Terriss. A number of prominent English and American bankers took part in the debate and a manufacturer from Italy referred to the stiff terms of accommodation granted by American banks. In explanation it was stated on behalf of American banking institutions that the system was not so centralized as in London, for there were 30,000 banks in the United States which had more or less to decide things for themselves. The great obstacle to confidence is the state of political ferment in Europe and when American bankers read of those things in the newspapers, they are constrained to a policy of caution.

Another delegate who had just returned from Italy spoke of the comparatively tranquil state of affairs in that country, and it was agreed on all sides that the newspapers and their greatly exaggerated accounts of political happenings did a great injury to trade by exaggerating those happenings. On the other hand, American bankers should learn to assess these matters at their true value and discount the obvious straining after effect.

A paper on the purchase and sale of cotton was submitted by A. Bryce Muir, of the Liverpool Cotton Association.

At the fourth session on Tuesday afternoon, Sir James Hope Simpson, of the British Bankers' Association, contributed a paper on "Financing Cotton Importing."

Sir Drummond Fraser, of Manchester, opened the afternoon session by an explanation of the Ter Meulen inter-

ST. GEORGE'S HALL AT LIVERPOOL, WHERE THE DELEGATES WERE ENTERTAINED AT DINNER.

national credit plan, and illustrated it in its relation to the cotton trade.

After the sessions of the second day were over, the delegates were provided with special automobiles which were placed at their disposal, and were conveyed to Calderstone Park in the outskirts of Liverpool, a well known beauty spot, where they were entertained to a garden party by Colonel Shute, president of the Liverpool Cotton Association. The delegates were announced to the President, who with his Lady, received them individually. A large number of local ladies also attended and a sumptuous tea was served to the accompaniment of the fine strains of an orchestra. Large and varied was the selection of national anthems which stirred the blood of each group of the nationals concerned. When the "Star Spangled Banner" was played the assembled guests showed the special favor of uncovering as a mark of highest respect. The Conference did much to cement the friendship of the American and English members and cannot be without its influence in the larger national sense. The members were particularly interested in the old English rose garden and in the lovely trees of this famous park.

The Third Day.

After two strenuous days of papers and discussions, the third day of the Conference—Wednesday, June 15—was taken as a holiday in a sense. In the morning the members

divided into two sections: those who visited the ship-building works of Messrs. Cammel Laird & Co., Ltd., and those who visited the world famous organization of Lever Brothers, the soap manufacturers. The latter visit to Messrs. Lever Brothers was of the deepest interest, for this firm has established successfully a system of profit sharing by the workers. The result of this plan was evident in the appearance of the staff, for during the walk through, the visitors were amazed at the speed of operation and the evidence on all hands of concentrated attention to the work in hand. A novel feature of this plant are the series of notice boards exhibited through the plant exhorting the workers to avoid waste of time or of material and there was abundant evidence that this was being done. The fire brigade gave a demonstration of their outfit; two engines are always at hand to suppress outbreaks of fire. The directors treated the delegates to a splendid luncheon.

A fine afternoon was devoted to short trips out to sea on tenders of the Cunard and White Star lines.

On Wednesday evening, the delegates were entertained at dinner as guests of the Liverpool Cotton Association. The dinner was held in St. George's Hall, and Lord Emmott, president of the Conference, acted as toastmaster.

Meetings in Manchester.

Following the dinner at Liverpool on Wednesday evening, the scene of the Conference was removed to Manchester. The meetings in Manchester opened in the Free Trade Hall of that city on Thursday morning, June 16th, when there was a large attendance of five or six hundred delegates and Manchester representatives were present to welcome the visitors. The scene in the Hall was very animated and quite a new set of faces were noticeable.

A welcome was extended the delegates by the Lord Mayor of Manchester on behalf of the city and by Lord Colwyn on behalf of the banking and mercantile interests. Suitable response were made by delegates from the United States and elsewhere.

Following the welcome address and the response, John Taylor, solicitor, Manchester, read a paper on "Yarn and Cloth Contracts," and this was splendidly received, showing the urgent nature of a further study of this subject. Mr. Taylor urged upon the Conference the importance of confirming by writing any variation of contract arrived at by word of mouth, and suggested the advisability of a uniform contract being arrived at for the whole trade. In the course of the debate which followed this paper the general feeling seemed to be that in the past the cotton trade was carried on by people believing that a man's word was his bond; however, the speakers made it clear that times had changed in many respects and mere word of mouth arrangements would not now hold good owing to the growing stringency of the times, and it was necessary to cover every verbal arrangement with a written statement to correspond.

Mr. Taylor also pleaded for a clearer meaning being attached to terms used in contracts, as from his experience as a solicitor to the trade, he had found this had given rise to endless disputes. It was decided to have this paper circulated to all manufacturers and merchants.

The paper presented by Frank Scudder on "Humidity and Ventilation in Cotton Weaving Sheds" was the most keenly debated of the whole series and a great many of those present detailed their experiences in countries as widely apart as China and Brazil.

At the sixth session, which was held on Thursday afternoon, William Howarth read a paper on "Characteristics of Cotton Required by the Spinner and Present Defects in Raw Material." This was given close attention, and in the discussion that followed the chief point was the grave difficulties caused by the presence of bits of hemp or jute among the cotton as this gave rise to serious trouble in all manufacturing operations.

The remarks of Dr. Harland, the botanist attached to the Department of Research in the cotton industry, were very interesting. He stated that in his experience in Egypt in evolving new types of cotton. he had found that more even staples could be obtained when the district was properly irrigated. When the land was allowed to depend on natural rainfall, the length of staple of the cotton was always variable and could not be relied upon. The cure for irregular length of fiber, according to Dr. Harland, lies in more general irrigation of the cotton growing areas.

The speaker gave some very interesting facts relating to his experiments in plant breeding, and showed that in Egyptian cotton it is possible to fulfill any requirement of the manufacturer by careful breeding on scientific lines. Another speaker from the same country said that very fine cotton types were often evolved in the course of their experiments which were regarded coldly by the trade. He stated that on many occasions they took no notice of very satisfactory types which were thus allowed to disappear on account of apathy. If manufacturers and spinners desired good cotton qualities, he stated, they would require to give greater encouragement to the propagation and spread of the new types brought out as a result of scientific investigation.

COTTON's special representative at the Conference, Professor William Davis, M. A., of University College, Nottingham, England, read a paper on "Quality and Nature of Cotton Yarns Used by the Hosiery Trade." This was prepared for the Conference at the request of the hosiery manufacturers of Nottingham, who make the largest quantities of cotton knitted productions in that country and the object was to place before the spinners the requirements of their trade in regard to this matter, so that a determined effort might be made to improve the quality of their yarns used in knitting. There were many spinners present and while some showed a disposition to resent the criticism of the yarns they supply to the trade, others agreed that much might be done by altering the processes through which such cotton yarns pass in order to make them more open in character. It was also suggested that some determined effort should be made to reduce the irregularities of spinning in such yarns, which is a grave defect at the present time. The paper appears in full on another page of this number.

During the afternoon session a paper was also read by A. J. Holt on "The Future Development of Textile Machinery" which contained many important points in regard to the further expansion of the trade by new devices and arrangements on cotton spinning and weaving machinery.

Other papers submitted during the afternoon were by Dr. Melvin T. Copeland, of the Bureau of Business Research, Harvard University, on "International Comparisons of Cloth Prices;" Dr. A. W. Crossley on "The Scope of a Research Institute for the Cotton Industry;" and Dr. Lawrence W. Balls, of the Experimental Department, Fine

Cotton Spinners' Association, on "The Possibilities of Exact Reporting and Forecasting of Cotton Crops."

At the conclusion of the afternoon session, the delegates were entertained to tea in the Foyer of the Octagon Court at the Midland Hotel where an excellent tea was served by the Manchester Ladies' Reception Committee which proved very refreshing and welcome after the strenuous time spent during the day.

Reception at Manchester.

The writer cannot recollect a finer occasion of brilliance and splendor than the function which took place in the Town Hall at Manchester, on Thursday evening, June 16th, being an official reception to the delegates by the Lord Mayor and Corporation of Manchester. The splendid suite of rooms comprising the Manchester Town Hall were placed at the disposal of the delegates and there was a large and brilliant assembly where it was interesting to note the great variety of dresses worn by the ladies including every kind of textile fabric and the regalia and academic robes of many of the gentlemen. Many of the guests spent an interesting time inspecting the pictures exhibited on the walls of the large chamber, while variety was lent to the occasion by the concert being held in another chamber where professional entertainers of considerable reputation had been engaged for the evening. This reception will never fade from the memories of those who took part in it and it corresponded with the foremost position of the City of Manchester in the civic affairs in Great Britain.

A number of the delegates elected to keep Liverpool as their headquarters and the Lancashire and Yorkshire Railway Company kindly provided facilities for their traveling free on their railway in first class compartments and on several occasions during the Conference placed special trains at their disposal. A number of the delegates stayed at the seaside town of Southport and were conveyed to that place each day at the close of the Conference free of charge by the railway companies.

The Fifth Day.

Friday, June 17th, was a day of strenuous work for the members, several papers of considerable importance were presented and these were eagerly debated in the five minute periods placed at the disposal of each speaker.

The morning proceedings, which took place in the Manchester Town Hall, began with a joint lecture by S. H. Higgins, of the Bleachers' Association, and Andrew Hodge, of the Calico Printers' Association, on "The Preparation of Cloth for Finishing." These speakers made a plea for closer cooperation between everyone concerned in order that the "faults" which created so much difficulty might be minimized, if not altogether eliminated. In the discussion of the paper, special reference was made to "black" cotton which one manufacturer said was treated in his factory and laid aside for use in black goods, but it was pointed out that the bleacher and finisher who had white goods sent to him could not do this because they dealt only with the cloth sent them for treatment. Many references were made to the difficulties created by the use of paraffin wax by manufacturers and converters and it was recommended that the use of this wax be eliminated wherever possible. If wax were necessary in weaving, a variety should be selected which would come out readily in bleaching.

John Jackson, deputy chief inspector of factories, presented a paper on factory accidents. In regard to accidents in factories, the discussion showed that much confusion was created in factories by the lack of standardization and the way in which inspectors recommended one form of guard which was condemned and had to be altered for the next inspector who had different views on the subject. There was a great need for educating the operatives in the use of those safety devices and to keep them in proper order, it was pointed out.

Albert Thomas, director of the International Labor Office, Geneva, was not present to deliver his paper on "Hours of Labor in the Textile Industry," and his place was taken by H. B. Butler.

In the absence of Arthur Watson, general manager of the London and Northwestern and Lancashire and Yorkshire Railways, H. H. Marriott, chief goods manager of the Lancashire and Yorkshire Railway, read Mr. Watson's paper on "The Transportation of Cotton."

E. T. Parkes, of the London City and Midland Bank, Oldham, presented an interesting paper on "Financing the Mills."

E. S. Butler, president of the New Orleans Cotton Exchange, read a paper on the "Economic and Insurance Necessity of Future Contracts."

Visit to Trafford Park Estates.

On Friday the delegates had a special treat in their visit to the Trafford Park Estates, where the fireproof safes are located for storing raw cotton prior to its being taken to the Lancashire mills. In this concern there 29 fireproof cotton safes which are constructed of re-inforced concrete with hollow walls. In connection with each safe there is a sprinkler installation with large water tank on the roof connected with powerful water jets all over the place. The bales of cotton are never placed directly against the wall, but are supported an inch or two from it so that pressure on the walls is practically nil. For all the sprinkler insfallations they have an electric pump, so that a powerful jet of water can be played on the material with a force which carries the water from one end of the building to the other.

Each section has high speed traveling cranes going in every direction so that any part of the storage space may be reached in order to remove the bales. Owing to the system adopted, it is possible for the men to remove the bottom bale in any part of the building in a few minutes. Each section is 165 feet long, 35 feet wide and 45 feet high, and the cranes travel at the speed of six miles per hour, many of them operated by women who display wonderful nerve traveling at such a great height and raising and lowering the bales into the sheds. The cranes load the cotton to and from railway wagons and also from lorries and motor trucks. From here the cotton is transported by rail, barge or road to the Lancashire cotton mills, and goods written for in the morning can be conveyed to their destination the same afternoon.

Among the advantages of storing cotton in these safes is that there are reduced fire insurance risks, less risk of damage by fire, saving in transport costs, efficient handling and storage, and quick delivery. Large firms engage those safes as a reservoir for their cotton supply, keeping one or more of the safes in constant use which insures that their supplies are kept regular.

In addition to the more directly interesting subject of cotton storage the visitors had a walk through the freezing

chambers for meat and had the curious sensation of moving from a temperature of zero to warm summer sunshine.

The other parts of the buildings afforded evidence of efficiency in handling and transporting all kinds of merchandise including wool by moving lattices and motor trucks and the concern as a whole is undoubtedly the last word in efficiency. The proprietors have also succeeded in devising a very successful system of dealing with their employees by which they are very contented and never leave the concern as a result of the good treatment they receive at the hands of the management.

Manchester Ship Canal.

A second party made an official visit to the Manchester Ship Canal on Saturday, June 18th, when lunch was served on the steamer during passage from Manchester to Liverpool and the visitors had every opportunity of inspecting the operation of this wonderful engineering achievement.

There was an exhibition of yarn and fabrics at the Textile Institute in Manchester, and this was attended by a large number of delegates during the afternoon. They were received by Secretary J. D. Athey, and the chief feature of the display was the samples of yarns rendered more lustrous than mercerized goods by special subsidiary operations in the chemists' laboratory; the luster and general appearance of these yarns evoked the warm admiration of the visitors. There were special types devised for the use of the jumper trade in knitting and very fine samples of straw were shown; also samples of what is probably the finest counts spun in the Lancashire trade, counts in the region of 400s cotton. Tea was served in the Institute during the afternoon and the visitors had a very intimate and interesting reunion with many Manchester friends who are prominent in the business world of cotton production.

Various other trips were arranged by the indefatigable committee; one was a visit to Bleaching and Dyeing Works, Messrs. Platt Brothers, Oldham, Asa Lees & Co., Ltd., Messrs. Dronsfield Brothers, Ltd., and lunch on the visit to Oldham was provided by the Mayor, Mr. Councillor William Lees. This visit to Oldham was accompanied by a drive over the breezy Yorkshire moors, with a dinner in the evening at the invitation of the Oldham Master Spinners' Association.

Saturday, Sunday and Monday, June 18th, 19th and 20th, having been devoted to entertainment, including the features just outlined and other trips, the Conference reconvened in Manchester on Tuesday morning, June 21st. J. Barber Lomax, president of the British Cotton Waste Association, presented a paper on the subject of cotton waste, on which there was some discussion.

Another paper presented at the session on Tuesday was on the subject, "Needed Reforms in Compressing, Ginning and Baling," by Albert L. Scott and F. S. Blanchard, of Boston. Mr. Scott, who is vice-president of Lockwood, Greene & Co., presented the paper, in which was suggested a closer and more frequent contact between representatives of the mills and growers and merchants, and a more carefully organized effort on the part of manufacturers' associations to keep in close touch with and to assist farmers' associations. It was urged that more care should be taken by the mills in the classing of cotton and the recognition in price of differences in character, smoothness, etc.; that the mills should take more interest in ginning; that careful consideration should be given by manufacturers' associations to the desirability of rebaling at the compresses with lighter bagging and buying net weights; and that manufacturers take up with railways and other interests the question of making a difference in favor of a car-load rate on cotton in order to bring about high density compression and to save car space.

On Wednesday, June 22, the various voting groups of the Conference met to take up and consider the various propositions placed before them and to elect their representatives on the executive committee. On this day also the executive committee met and the officers for the coming term were chosen.

The Conference was brought to a close on Wednesday evening by a dinner in the Free Trade Hall, at which Viscount Birkenhead, the Lord Chancellor of England and J. Butler Wright, Counsellor of the American Embassy, who was present in the unavoidable absence of Colonel George Harvey, American Ambassador to England, were the honor guests.

"Textile Machine Drawing" is the title of a book by T. Woodhouse and A. Brand, which has just been published as the third of a series of elementary manuals dealing with the science subjects most closely related to the textile industry. The two previous works are "Textile Mathematics" (in two parts) and "Textile Mechanics." This third work, "Textile Machine Drawing," was prepared to enable prospective textile students and others to become familiar with machine drawing. There is a great advantage in textile machine drawing, the very work of drawing the various parts of a machine provides an insight which can be equalled only, perhaps, by an extended acquaintance with the machine and its functions, and even then it is a valuable asset. The book is published by Blackie & Sons, Ltd., 50 Old Bailey, London, England.

The 1921 edition of the Official American Textile Directory has just been issued. This contains the usual listing of textile plants, giving information concerning the names of officers, kind of goods, equipment, etc. There are about 9,500 textile establishments listed in this edition. A new feature of this year's directory is the addition of a list of textile establishments in Mexico. The directory now gives complete reports on the textile plants in the United States, Canada and Mexico. Other features included in the directory are: mills with worsted machinery; list of textile associations; yarn trade index; classified list of cloth manufacturers; commission and order and raw material sections; list of selling agents and dry goods commission houses; export commission houses; machinery and supply section. The directory is published in three sizes: office edition; travelers' edition; and vest pocket size (in three sections) by Bragdon, Lord & Nagle Co., New York.

The Lombard Iron Works and Supply Co., Augusta, Ga., are manufacturers and dealers of mill supplies, pulleys, shafting, hangers, castings, etc., for cotton mills, and are also in a position to do machinery repair work. They report a nice business from cotton mills, having manufactured quite a lot of attachments for looms for mills changing over from one class of goods to another, thus making this special equipment necessary.

Cotton Yarns Used by the Hosiery Trade.*

BY WILLIAM DAVIS, M. A.†

As representing a district which uses enormous quantities of cotton yarn in knitted goods, I may be permitted to place before the members of this Conference the point of view of the knitting manufacturer in regard to the cotton yarns supplied to him for use in his production. Rightly or wrongly, there is a wide-spread feeling that the peculiar view point of the maker of knitted goods is often little appreciated by the cotton grower, shall we say, and the spinner, and if this effort should result in placing the matter in clearer perspective, a useful purpose will have been served. The cotton spinning industry has been founded primarily on the requirements of the older industry of weaving, and the needs of this branch of the textile industry have been carefully studied in connection with the evolution of the spinning machinery, and in determining the processes through which the raw material shall pass in the operation of yarn manufacture.

With the maker of knitted goods the individual yarn is of the utmost importance, because the single thread builds up the entire fabric in such a manner as to constitute it a weft fabric, and if this thread gets broken at any point, a very large imperfection or hole is rapidly produced, which expands in every direction as loop after loop loses its support. In the woven fabric the chief strain on the thread is in the warp, and should one individual thread give way in the fabric, the effect is local and confined to the part where the rupture has taken place. There is, further, a considerable difference in the strain essential for a successful warp yarn and a suitable strength of weft yarn where the pull is not nearly so great, a circumstance which enables the maker of woven goods to obtain special results in regard to softness of handle by the use of softer twined weft. In the knitted fabric there is no such division of function, the single thread is responsible for both the vertical and horizontal elements of the texture, and the structure of the thread has to provide the strength essential for the strains of knitting and, along with this strength, the softness of handle of the material must be preserved.

Twist.

Tensile strength is intimately connected with the matter of twist in the yarn, where the requirements of the knitting thread are somewhat different to that of weaving. The spinner is always confronted with the difficulty of retaining an open kind of yarn, which will respond to any brushing operations required in finishing, and on the other hand, he must, by adequate twist, attain a suitable tensile strain if the yarn has to be successfully knitted. It is well known that a thread under increasing twist undergoes a series of gradation in regard to tensile property, in the first twist area the thread is extremely soft, and the least increase of twist marks a great accession of tensile strength. In the second stage increasing twist does not make the same decided difference in tensile strength, whilst in the third stage increased twist makes the thread no stronger, and eventually bursts the yarn altogether. For warp yarns we usually fix on twist in the second or third region whilst weft yarns are generally selected from the first series of twists. In the case of knitting yarns many of the physical essentials of the yarn are to be found in the first region of twist, whilst others can only be obtained in the second region. In the case of woven product we can separate the properties over two series of thread, one the warp and the other the weft, and attain a satisfactory result, but in the knitted product the various essentials of firmness and softness of handle have in some subtle manner to be combined in one and the same thread. Knowing these facts, the manufacturer can have sympathy with the difficulties of the spinner, who is often called upon to do miracles with his machines in regard to knitting yarn production. The difficulty of co-ordinating conflicting essentials in the thread is very great, and lies at the basis of many of the imperfections of the yarns supplied to the trade. Although this is the case, we affirm that the needs of the knitting industry are sufficiently important to merit their concentrated attention at the hands of the spinner. There is often a too slavish adherence to the ordinary routine of yarn manufacture found suitable for the weaving thread, but not equally adapted to the looped texture.

Internal Strains.

The yarn employed in knitting is subjected to a considerable diversity of internal stresses and strains during the operation of loop formation. In making the loop, the thread is pushed between needles and sinkers into curved formation when considerable internal yielding of the fibers is essentially caused, and the fibers require to slip over each other to yield to the pushing force of the sinkers of the knitting machine. The strain is applied to every fragment of the yarn along its entire length, and thus the knitting thread requires a greater degree of yield or elasticity than the ordinary weaving yarn. This is generally achieved by keeping the twist as open as possible, but it is also an advantage in cases of dry, hard yarns to treat them with some softening agent to increase the slipping of the fibers over each other, and enable the knitting to be satisfactorily accomplished. It will thus be seen that a yarn sufficiently strong in regard to ordinary breaking strain may fail if it does not possess sufficient reserve of elasticity to enable it to withstand those severe internal strains during the operation of knitting. The tensile properties required depend to some extent on the purpose which the yarn has to serve. If the yarn is intended for footwear, the breaking test requires to be larger than is the case for underwear yarns. It requires to be more firm in character and usually a slightly harder twist is given than is the case for underwear yarns. In testing a yarn on a knitting machine, ordinary plain circular knitting is not sufficient, and any test for knitting power is not complete unless the yarn can be successfully manipulated for the heel and toe, where the movement of the machine is reciprocating, and extra strain is thrown upon the yarn. Spinners have complained lately that certain well-known brands of cotton have fallen short of their usual records of tensile strength and elasticity, and has been stated as being due to early maturing of the cotton bolls in last season's crop.

*An address before the World Cotton Conference at Liverpool, England.

†Lecturer on Knitting Subjects at University College, Nottingham, England, and COTTON'S Special Representative at the Conference.

Surface Characteristic.

The characteristics of the surface of a cotton yarn to be used for knitting is, in general, quite different to the normal weaving yarn, and in most cases the object should be to get away from the mechanically perfect even-surfaced thread where the fibers are combed parallel with each other, and lie densely packed in the body of the yarn. In general, a process of carding is to be preferred to that of combing, as this allows for a better covering of the thread with surface projecting material, which serves to cover up the baldness of the knitted loop structure. If this short surface fiber is but loosely connected with the parent thread, it will soon clog up the needles of the machine and cause trouble with needle breakage. In recent years there has sprung up an enormous trade in cotton-knitted goods, where the fabric is produced at a high rate of production on one or other of the plain multiple-feed machines, where the quality of the fabric in regard to regularity of loop formation may not satisfy the fastidious connoisseur, but which, nevertheless, enjoys a great demand on the market. In such cases the natural fibrous nature of the yarns employed to cover the outline of the loops is further accentuated by a gentle brushing on the raising gig. For fleeced underwear, where it is desired to obtain a soft inside for the garment, it is usual to knit a specially thick, soft-spun yarn with a long staple, which will give free scope to the action of the teasles, and on the face is a more robust cotton yarn which forms the neat structure of the surface. When brushed fabrics of single thread texture are desired, the mainutest care must be taken with the setting of the teasles of the brushing machine, and the yarns should be composed of long-stapled cotton which will enable the fibers to be raised on the surface without materially weakening the tensile property of the yarn in the fabric. Burst fabric is very common in such goods, due to the causes mentioned, and it is a defect which entails an enormous amount of waste.

Cleanliness.

It is generally recognized that in too many cases we have not been able to regain our former standards of excellence in regard to clean yarns, and this has a special significance for many classes of knitted fabrics which are sold in the cream or white, and where their status depends on the quality of this white. This is considerably influenced by cotton which has been improperly cleaned and where these take the form of hard particles of burr they seriously interfere with the knitting operation, especially in the finer gauges. When we consider fabric with about eighteen needles per inch in the machine, with a web holder working between each needle space, there is scant allowance for yarn diameter after the thickness of the needle and web holders have been considered. If into this diminutive space between the web holder and the needle we project a hard piece of vegetable matter sticking on the yarn, instant damage is caused to the needle. The latch of the needle is bent out of its true path and rendered incapable of knitting perfect loops, and often a row of ragged stitches are formed before the flaw is discovered. It is easy to understand that irregularities of this kind on the yarns combined with thick portions of slubbing, add considerably to the cost of manufacture by increasing replacements of needles in the machine added to the waste fabric caused. This is particularly severe in the making of the fine gauge hosiery web which has come to form such an important branch of the knitting industry.

Evenness.

In the course of my experience amongst the makers of cotton-knitted goods, the results of uneven yarns stands out clearly as one of the most serious drawbacks to the making of such goods, and as the cause of endless trouble in the productions of this branch of the trade. Many of the yarns being supplied at the present time are gravely deficient in regularity of diameter, and owing to the unithread character of the looped texture, the variable loop structure stands out in great clearness, and at once makes itself evident to the observer. I have come across an enormous number of such cases within the past few months, and it is certainly a subject worthy of the most serious consideration of the Conference. It has been suggested that the cause lies farther back than the preparing or spinning process, and that modern methods of high-density baling have had their influence in this result. It has been stated seriously that the enormous pressure to which these bales of cotton are subjected, with the primary object of saving space in the course of transportation on railroad and steamer, leaves a permanent mark on the material. To disentangle those firmly welded fibers, it becomes necessary to adopt more strenuous opening methods, whereby the amount of short neppy material is appreciably increased, with a corresponding increase of neps and slubs in the yarn owing to the manner in which short members adhere to each other and resist the opening process. It has been suggested that this has caused a reduction in the spinning power of many cottons, as it is difficult to get them spun into regular yarns. Yarns of this type cause considerable trouble in the fine gauge knitting machines, and lead to considerable breakage of needles. More serious than this is the direct effect in the fabric itself, the loops at such points being conspicuously uneven in build, and thus impair the salability of the product, or provide a suitable ground for rejection. When such fabrics have to be brushed for use in underwear, the defect is made even more apparent for the teasles of the brushing machine readily catch on the fibers of the thicker portions of the thread, whilst the thinner parts are missed entirely, this giving rise to a mottled effect.

The Link-Belt Company has acquired all of the capital stock of the H. W. Caldwell & Son Company, and Frank C. Caldwell has been elected a director of the Link-Belt Company. Two experienced and successful companies in the conveyor world have thus joined forces, with the result that the Link-Belt Company has added two new lines, Helicoid conveyors and power transmission machinery, to its line of manufactures. While the H. W. Caldwell & Son Company's plant will continue to operate under separate corporate existence and under its present name, the joint facilities of the two companies, together with broader avenues of distribution of the Link-Belt Company, is expected to prove of distinct advantage to the customers of both. There will be no change in the diversity or character of the products of the Caldwell company, and the plant management will remain substantially the same, it is announced.

The Klauder-Weldon Dyeing Machine Company announce that they have moved into their new and more commodious general offices and plant at Bethayres, Pa., where they will be prepared to take care of requirements of customers in dyeing, bleaching and scouring machinery.

Characteristics of Cotton Required by the Spinner and Present Defects*

BY WILLIAM HOWARTH.

The simple economic rules of the world teach us that people can only hope to receive the equivalent of what they give. The same truth applies to nations and industries, and is well understood by the leaders in commerce. It may seem strange, therefore, to the onlooker, who sees and knows the extent of the trade in cotton goods, that it should be thought necessary to make a statement as to the characteristics required in the raw material of our industry.

It has been said, reproachfully, that spinners have never clearly indicated their requirements. Possibly, what is meant by that statement is that when planters have sought information from a number of spinners as to their particular needs the answers have largely cancelled each other. The reason for this is clear. There are approximately 154,000,000 spindles employed in spinning cotton. It is probable that the average number of spindles under one roof is less than 60,000. If this assumption is correct, there are about 2,600 cotton spinning mills. Each of these mills is expressly designed to produce an established quality of yarn from a known type of cotton. Broadly speaking, there are five classes of spinning mills. Our Oldham friends classify them as thick, coarse, medium, medium fine, or fine mills. The thick trade, which produces yarn up to 10s counts, uses very largely short stapled cottons or cotton waste. There are sections, however, which require and use ordinary American or long-stapled and exceptionally good Egyptian cotton.

The coarse section carries the making of yarn up to 22s counts, and selects its chief supply of raw material from Indian growths, ordinary Upland American, or one or other of the new growths which have been grown and put upon the market during recent years.

The medium trade is represented by the spinners who produce yarns up to 46s counts. Naturally, the bulk of cotton used in this section is of longer staple and higher grade than the general qualities used in the coarse trade. Full 1⅛ in. to 1¼ in. American, Upper Egyptians, East Africans and similar types being in common use.

The medium fine trade sets out to produce yarns from 46s to 80s counts, and finds its chief source of raw material in the various classes of Mitafifi, Egyptian growths in general other than Upper Egyptian, and in some cases Sea Island cotton.

The fine trade, which carries the spinning of cotton from 80s to the limit the fiber will permit, sometimes as high as 400s counts, and occasionally to 700s, is based upon the finest, most perfect and longest staples grown.

There are, of course, in each section into which the trade is divided, spinners who cater for special purposes, and very often spun down qualities, or qualities spun from the finest and most expensive material are made into counts which ordinarily call for a cheaper and less perfect starting point. It is because of these differences in usage that misunderstandings have arisen.

Spinners are very human. They have probably their full proportion of selfishness. When, as individuals, they are asked to define the characteristics of the cotton required by the trade, the needs of their individual mill spring first to mind. The exact staple suited to their requirements are mapped out accurately. The grade and color and other features which form the basis of the yarns they produce are properly stated. Nor can the spinner be blamed for narrowing his outlook. Each of the 2,600 mills is mapped out to produce a limited range of counts from a given staple. It is, of course, possible to arrange a mill to spin any and every class of cotton, and, by changing the cotton, the roller settings and speeds at the various processes to produce any required range of counts except the superfine. As, however, the mapping out of a mill to produce yarn covering a wide range of counts can only be done by sacrificing competitive efficiency in every section, the range is deliberately limited. Human and mechanical efficiency have thereby been developed to a very high degree, and have combined to bring down costs of making yarns from cotton to a lower point than can, I think, be shown in any other trade where equivalent problems have had to be solved and similar results attained.

As the trade is at present constituted each spinner sets out to produce at the cheapest possible rate the class of yarn he sells. He takes a pride in his production, and whether he produces a low quality or a high-grade quality he does his best to produce the same features regularly. He endeavors to produce, within the limits of cost fixed for him by competition, as clean, round and strong a thread as the raw material he uses and the equipment of his mill will permit. This result he sets out to secure without taking out of his cotton an excessive amount of waste or adding to his manufacturing costs by reducing his production at the different machines through putting in excessive twists.

The characteristics of raw cotton which enable a spinner to attain the best results with a minimum of labor may be stated as follows:

First, and most important of all: The fibers must be even in length.

Second: The cotton must be ripe.

Third: The grade must be even.

Fourth: The cotton must be as free as possible from dead cotton, bearded motes, seed, fibers other than cotton, sand, iron, stones, excessive moisture and other foreign substances.

I have placed evenness in length of fiber as the first desideratum, and for the following reasons: If a yarn is to be uniformly round and of maximum strength it must necessarily have an equal number of fibers, twisted together in each and every fraction of its length. This condition can only be obtained if the staple is even in character.

The cotton arrives at the mill in a tangled, sometimes even in a matted mass. The first machines in any mill equipment, the bale breakers, openers and scutchers, are designed to loosen and open the mass, remove foreign substances such as leaf, seed, sand, etc., and form a carpet or fleece of the partially cleaned cotton. The fleece is formed into a lap or roll and fed to a carding engine, which further

*Presented before the World Cotton Conference.

frees the cotton from impurities, and deposits the cotton into suitable cans in rope or sliver form. The card also, in some slight measure, tends to put the fibers into the sliver parallel with each other, and, as far as present mechanical ingenuity can arrange, with an equal number of fibers in each and every cross-section of its length. It cannot, however, be said that anything beyond a tendency in this direction has so far been accomplished. The rope or sliver of cotton is now transmitted to a sequence of machines which vary in accordance with the type of cotton or the purpose to which the finished yarn is to be put. The purpose of these machines is to secure that an even number of fibers are traveling forward together, and to gradually reduce the thickness of the sliver and the number of fibers in the cross-section until the correct counts are arrived at. This process is called drafting.

With the exception of the comber none of the drafting machines has any claim to be considered a cleaning agent, nor have they any fiber length selecting power. The comber itself, as at present made, cannot be considered as being of much use for cottons below 1¼ in. in length, or, when dealing with longer cottons, as being capable of more than eliminating fibers below a given measurement and passing forward into its finished product the fibers above the minimum selected. Yet none of the drafting machines can thoroughly effect its purpose if the fibers presented are uneven in length. For the purpose of illustration let us take an absurd and extreme case. We mix together Sea Island cotton with 2¼ in. length of staple and an Indian cotton of ⅝ in. and attempt to make a carded yarn. The difficulties of the blowing room and the card need not be discussed. When the draw frame is met the position is impossible, The reasons are not obscure. Suppose we have six ends up with six of a draft. This draft can only be obtained if the back rollers of the draw frame retain a firm grip on the sliver presented and feed forward at one-sixth the rate at which the front roller is delivering. The second and third rollers, although they are drafting agents, may for our purpose be considered as carriers. The rollers are distanced or set from each other fractionally beyond the length of the longer staple in order to insure that the long fibers shall not be broken. Every practical man knows what the effect of this experiment would be. The longer staples would be more or less unevenly drafted, for the draft depends upon the clinging action of the fibers as well as upon the differential speed and setting of the rollers. The shorter fibers, however, would ride upon the longer ones, would not be drafted at all, the finishing head would be thick and thin without regularity of any description and would provide a basis from which the production of a uniform thread would be impossible. Probably most managers and carders have seen a result similar to the foregoing when a little card strip or comber waste has accidentally got into the mixing.

Coming to a more regular occurrence we can assume that cottons of 1⅛ in. and ¾ in. staple are traveling together, and that by some fortuitous circumstance the fibers have arrived, say, at the intermediate frame, so arranged that the front ends of the fibers are presented in regular sequence and a good drafting is secured. For presentation to the roving frame the fibers will be presented from the intermediate bobbin in the opposite direction to that in which they were previously presented, the longer fibers will take the strain, and the short ones will float, some of them will disappear as waste, others will be taken down by the middle roller and become a basis for a roller lap, and the full effect of the unevenness will show itself in the roving and be carried through to the finished yarn.

An ideal drafting is where the fibers are presented to the drawing roller in a sequence which is equal to the number of fibers in the thickness of the roving.

Seeing that the direction of presentation is changed several times during the progress of the cotton through the several machines it is obvious that a perfectly level even thread cannot be made when uneven lengths of cotton are worked together.

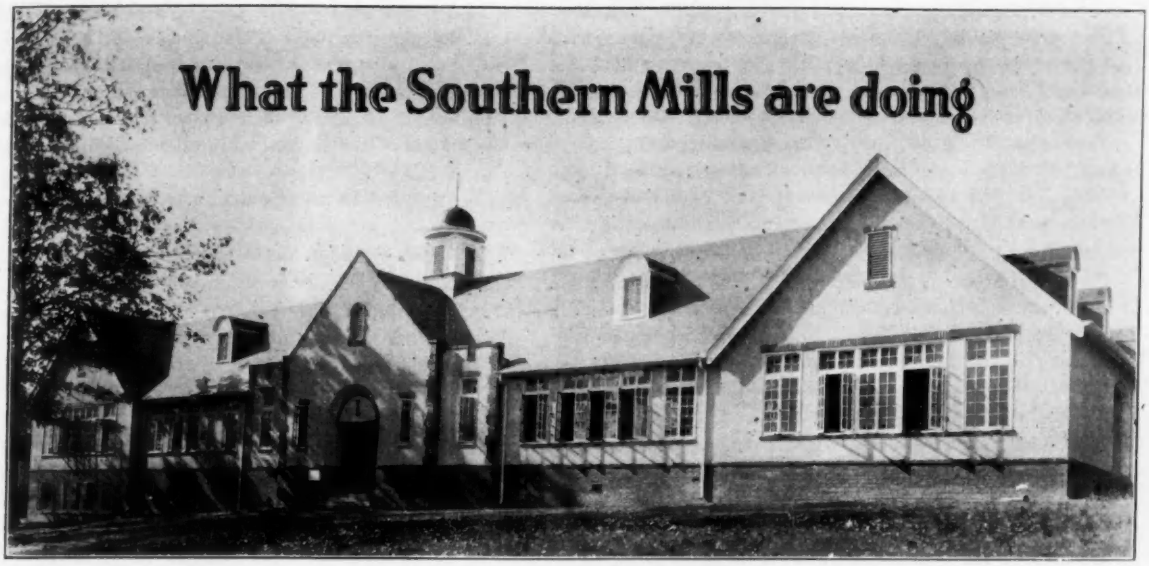
Dr. Balls has recently perfected a machine whereby the evenness or otherwise of a sample of cotton can be accurately gauged. When this machine is properly appreciated and regularly used, growers of cotton will find themselves repaid for any trouble they may take in establishing evenness by the extra premium they secure on approved types as compared with the price they will obtain for inferior ones.

The second essential quality is that the cotton shall be ripe. Each spinner adopts his own method of judging which of a number of samples of cotton submitted to him is best suited to his purpose. Ripe cotton, however, appeals to all. There used to be a saying in Lancashire: "If cotton sits up and looks at you don't buy it." The soft flat ribbon character and the lack of natural twist which are features of unripe cottons form the basis of considerable trouble which experienced spinners try to avoid. A spinner whose trade is of such a character that he cannot afford, at whatever immediate cost to himself, to use anything but the best grown and perfectly ripe cotton, may run his mill from year to year without altering his waste percentages, his twists at various processes, or the production per hour of any of his machines. The quality of his yarn is constant and his labor troubles few. On the other hand, it must be remembered that the bulk of the trade is keenly competitive in character, and caters for a clientele who cannot afford to pay high prices. Again, the general weight of cotton available, and which must necessarily be used, does not permit the average spinner to reject bales in which faults are apparent. The unripe fibers may vary in each bale in their proportion to the ripe ones. These unripe fibers get broken up in the cleaning processes, and although they may have an original length equal to the ripe fiber, add to the problem of drafting as discussed under the heading of even length. The broken and weak fibers often get rolled into a knot, which constitutes the "nep" of which manufacturers complain. The weakness of the unripe fibers which pass through the cleaning process without fracture brings down the strength standard of the roving and the yarn. In these days such a variation from a standard is a sure source of labor trouble. Wage lists in the cotton spinning industry are based upon production. Ripe cotton carrying plenty of natural twist enables operatives to run the machinery at the maximum speed and with a minimum of added twist at the processes following the draw frame. The employer secures a good production and the operatives the maximum wage. The yarn is thereby cheaply produced and generally finds a ready sale.

Defects in finished cloths, especially in dyed goods, are very often attributed to the presence of unripe fibers in

(*Continued on page* 790.)

What the Southern Mills are doing



School Building at the Indian Head Mills of Alabama, Cordova, Ala.

The 15th summer session of the Cotton Manufacturers' Association of North Carolina was held at the Battery Park Hotel, Asheville, N. C., on Friday and Saturday, July 8 and 9, and a number of interesting addresses were delivered. Among the speakers were Governor Cameron Morrison, Ex-Secretary of Navy Josephus Daniels, Gen. L. D. Tyson, Dr. D. W. Daniel and Dr. Jno. E. White. A. H. Bahnson, of Winston-Salem, was elected president for the coming year, succeeding T. C. Leak, of Rockingham. Mr. Bahnson was first vice-president last year. J. H. Webb, of Hillsboro, was named first vice-president, Bernard M. Cone, of Greensboro, being elected second vice-president. E. C. Dwelle, of Charlotte, was elected third vice-president to succeed Mr. Cone. Hunter Marshall, Jr., of Charlotte, was re-elected secretary and treasurer.

The Dallas Cotton Mills, Huntsville, Ala., will erect a high school for the children of its operatives. The construction work has been begun and the building will be ready for occupancy by the first of January, it is announced.

The Palmetto Cotton Mills, Columbia, S. C., have bought eleven lots in the Rose Hill section of Columbia which they will use for development work.

J. T. Lupton was elected president of the Dixie Mercerizing Co., Chattanooga, Tenn., succeeding J. H. Wilson, at the annual meeting of the stockholders and directors of the company which was held recently. Carter Lupton was made treasurer. A number of changes in the organization were made. This reorganization took place as a result of the purchase of a majority of the stock by the Luptons several months ago. The entire output of the plant, which is running at maximum capacity, is sold through August, according to announcement at the directors' meeting.

The Sadie Cotton Mills Co., Kings Mountain, N. C., is according to reports, contemplating the doubling of its capacity.

The Brookside Mills, Knoxville, Tenn., are installing 612 looms in their new weave shed.

The Gluck Mill, Anderson, S. C., has given contract to J. J. Baldwin, architect, for plans for four new houses to be built for overseers at this mill. The total cost will be about $20,000. The houses will likely be of hollow tile, or stucco construction, and will have water, lights, sewerage and heating facilities. They will be erected on a new street which has recently been opened in the mill village.

Announcement has been made that the Lockmore Cotton Mills, York, S. C., will build an addition, 100x143 feet, to its present plant, and that construction work will begin immediately. The cost will be approximately $40,000, and the addition will be constructed with a view to adding more machinery.

The interest of R. Hope Brison in the Capitola Manufacturing Company at Marshall, N. C., has been acquired by H. S. Robinson and associates, of Lincolnton, N. C. Mr. Robinson will succeed Mr. Brison as secretary and treasurer of the mill company. A. Q. Kale, of High Shoals, N. C., will continue as president, the sale having effected only the holdings of Mr. Brison.

The Equinox Mill, Anderson, S. C., is to build a large general department store at an early date. There will be a drug store, a grocery store, a dry goods store, a sanitary barber shop and a pool room on the first floor, while the entire second floor will be made into an auditorium, which can be used for moving picture shows, etc., by the operatives.

A $1,000,000 plant to manufacture cotton fabric for automobile tires, furnishing employment to approximately 2,000 persons, is to be constructed at Los Angeles, Calif., by the Owens Tire Company, of Cleveland, Ohio, it is reported.

The Puritan Mills Co., Fayetteville, N. C., are throwing out 100 plain looms and replacing them with 100 1x4 and 1x6 box, 20 and 25 harness dobby looms to weave fancy ginghams.

It is announced that the Pelzer (S. C.) Manufacturing Company has decided to continue the high school at that place and add the eleventh grade to the school curriculum. With the domestic science department and the eleventh grade, the school will rank with the best in the state.

Prof. S. M. Derrick is superintendent of schools.

The large building program inaugurated more than a year ago by the Laurens (S. C.) Cotton Mills Co., is about completed. One hundred and fifty residences of modern type have been erected during the past year at a cost ranging from $2,000 to $3,000 each. They are of the bungalow order, four to six rooms, and are provided with all modern conveniences. The village streets have been relocated, and with the new houses, the town presents a different appearance.

The Royal Mills, of Charleston, S. C., are to rearrange their present machinery lay-out and to install new machinery and equipment necessary to improve the quantity and quality of the manufactured product. The services of Lockwood, Greene & Co., Engineers, Atlanta, Ga., have been engaged to carry on these changes.

The installation of machinery in the plant of the United Mills Co., Mortimer, N. C., has been completed. The equipment includes 6,300 ring spindles and 4,000 twisting spindles. Production will be on counts below 20s.

Surveys have been finished and plans made for a hydro-electric development on Wilson's Creek, near Lenoir City, N. C. About 1,800 horsepower will be developed. Textile mills operated by the Hudson Cotton Manufacturing Co., the Lenoir Cotton Mill, the Moore Cotton Mills Co., the Steele Cotton Mill Co., and the Whitnel Cotton Mill Co., will be supplied with current.

The Kindley Cotton Mill, Mt. Pleasant, N. C., is spending about $60,000 for new machinery and other improvements.

Textile mills and other industrial enterprises throughout the Piedmont section of the Carolinas are affected by the increase in power rates which has just been granted to the Southern Power Co. by the North Carolina Corporation Commission. It is as yet impossible to figure how much the cost to power users will be increased, owing to the various rates that are now paid by individual users, contracts made over a period of 10 years or more showing considerable variation.

By far the greater number of cotton mills in this territory are operated by electric power and practically all of which is furnished the mills by the Southern Power Co. Even those mills which have steam plants are users of "secondary power" furnished by the company.

Officials of the Corporation Commission figure that the income of the power company will be increased by approximately 20 per cent by the increased rates granted them. The schedule of rates petitioned for by the power company and the schedule granted by the commission are in a ratio of about 40 to 25, the average increase on all classes of power amounting to approximately 70 per cent of the full schedule of increase asked for.

A number of the mills have been fighting this increase by endeavoring to enforce the continuance of the present contract rates which, in some instances, are for a term of years.

On Monday, July 11, the Lancaster Cotton Mills, at Lancaster, S. C., resumed operations after having been closed down since June 21, in accordance with an announcement from the management of the mills that such action kets in this vast group of our manufactures, and thus do union." The conditions under which the work is now resumed, announce the officials, are the same that have obtained at the mill for 25 years, namely, that the mill shall exercise its right to choose its employees as it sees fit, and not to deal with any one not employed at the mill. Another feature of the re-employment of workers was that each applicant should go to the overseer of the department in which he desired employment in order to secure work.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, July 16th, 1921.

Developments in the cotton market during the past month favored the constructive side of the account, values having advanced about one cent or $5 per bale in consequence.

The labor situation in the British Isles improved materially, the strike in the cotton mills having been settled, and the prolonged coal miners' strike was brought to an end.

The Bank of England reduced its discount rate, which was as high as 7 per cent some months ago, from 6½ per cent to 6 per cent, and the prospects are for a further lowering of the rate in the near future.

But by far the most favorable development was the decision of British spinners to increase production by the mills, which have been running on half-time since last December. Mills using Egyptian cotton are to resume full time, while mills consuming American cotton are to run 35 instead of 24 hours weekly, or 75 per cent of capacity.

In consequence of the ending of the British labor troubles and more spindles set in motion, there has been already a marked improvement in the demand for spot cotton in the South and in Liverpool, with values tending higher. A change for the better has also taken place in the demand for cotton goods at home and abroad, especially at Manchester for account of India and China. Meanwhile there has been a decidedly better export movement of cotton to Europe, made possible by heavy takings by Germany, so far about 1,250,000 bales vs. about 600,000 last season.

Six weeks ago indications were that total exports from the United States this season would be about 1,500,000 bales less than last season's total of 6,366,000 bales, now prospects are that they will be only about 1,000,000 smaller than last season's shipments, now amounting to 5,233,000 against 6,264,000 to even date last year, of which 116,000 were shipped during the past week vs. 42,000 last year.

In view of the fact that Germany is making rapid recovery industrially, Japan recovering from the recent extensive depression, England getting back to work and America slowly but steadily returning to normal, there is every reason to anticipate a much larger consumption of American cotton by the world next season; this season's consumption pointing to only about 10,000,000 bales whereas it was much as nearly 15,000,000 bales five years ago. That being the case, the large surplus to be carried over by the world at the close of this season, July 31 next, estimated at about 10,000,000 bales vs. about 6,000,000 last year, is gradually losing its former depressing influence as market factor owing to the outlook for a very small crop this year, due to the big reduction in the acreage, low condition of the crop, the large reduction in the use of fertilizer, numerous weevils, and perhaps, by possible tropical storms or an early killing frost in the fall.

Returns to the government indicate an average reduction in this year's acreage of 28.4 per cent, or 26,519,000 acres against 37,043,000 last year, a decrease of 10, 524,000 acres, which is the smallest acreage in about 15 years. Not only is this so, but the government bureau averaged the condition of cotton as of June 25th at only 69.2 vs. 70.7 one year ago and the ten-year average of 78.8.

Based on the reduction in acreage and condition of the plant, Washington estimated the probable yield at only 8,433,000 bales vs. 11,450,000 bales indicated last year on July 1st, but which crop eventually proved ultimately to be 13,271,000 bales because of favorable climatic conditions and no damage by weevil of consequence thereafter. Therefore, the present indicated yield is nearly 5,000,000 bales smaller than last year's final crop, and as money is becoming easier, consumption increasing at home, and exports assuming larger proportions, buying, especially on important depressions, would seem to be advisable in anticipation of the probability of higher prices eventually.

The New England Mill Situation.

Curtailment of production in the cotton mills of New England is still very general and will be continued throughout the summer, especially in gray goods centers. Gingham, wide sheeting, and pillow tubing looms are fully employed, and there are some other divisions of the industry well engaged. In the past week or two, four or five of the smaller mills of B. B. & R. Knight, Inc., in Rhode Island have been closed and the mills specially constructed to make automobile fabrics are only moderately occupied.

During the month one of the Congressmen from Massachusetts, in speaking on the tariff bill now under discussion, referred to the great poverty in New Bedford and Fall River and the unusual calls upon the poor departments of the two cities. As a matter of fact it is still true that the savings institutions of both cities have been showing gains in deposits, while real poverty is nonsensical as applied in these instances. Two-thirds of all the operatives required if all the mills were running are now working under a wage schedule that gives them in four days what they used to earn a few years ago in six days. There are many of the largest plants that are running in full. In Fall River, for example, the American Printing Company in its print works and mills, has been employing more people steadily and turning out more goods, in the past four months than ever before in its history of more than 75 years.

It is also of importance to note that the dividends paid by the mills of New Bedford and Fall River have not yet returned to the average pre-war basis of a six per cent annual dividend, which was then called exceptional. In Fall River, the Hargraves and Parker mills, and the Laurel Lake mills were caught in a financial jam as a consequence of bad management, but it is still true that the quick assets of nearly all the mills still overlap the debts.

There have been several discussions throughout New England concerning lower wages, but it is known that several of the largest and most important mill managers are against any further reductions at this time. It is believed that no change arising from concerted action will be made before December when the usual six months' agreement expires. The reason why manufacturers are not willing to consider further reductions now was explained by a manufacturer in discussion with his selling agents in New York recently.

Said he, "When a skilled six-loom weaver on fancy goods can only earn $3 a day, while an electrician, hardly more than a mere boy can earn $10 a day in the same city, and a street laborer commands $4.50 a day, I will not favor a further reduction among mill workers. Perhaps when taxes, rents, fuel, and other things come down, it will be fair to act. I have been with our mill 31 years, and my experience convinces me that a strong effort should be made to maintain a higher wage standard among operatives and pass the cost to consumers through greater economies in distribution."

Another wage matter that has stirred up hard feelings in many places arose from the charge of a southern editor that the strike at Charlotte, N. C., was being instigated and supported by aid from New England manufacturers. While it is quite possible that some individual manufacturers have gone wrong, (the Lord Himself selected twelve men and one went bad), it can be said upon the authority of some of the best known mill men in the section, that they have not been, and would not be a party in any way, to such despicable methods. Nor do they believe that the great majority of southern manufacturers have any other notion concerning them. The United Textile Workers is a thoroughly discredited organization among manufacturers in Fall River and New Bedford, where the strongest and oldest textile unions center. One other fact of strike experience in New England is cited to show that the southern troubles are not taken as seriously as some newspapers take them. Textile strikes that amount to much are not won unless they are backed with finances saved and controlled by the operatives themselves. The U. T. W. does not maintain strike funds as English and New England unions do, and that is one reason why there is apt to be more talk than real resistance among southern strikers.

It should not be inferred that New England manufacturers are not keenly alive to the difficult competition that is being forced at this time by the ability of southern cotton mills to run longer hours and pay lower wages than is true in most of the New England centers. But the advantages of longer hours and lower individual wages do not mean final success in cotton mill competition, otherwise the cotton industry in England and in New England itself, would long since have been out of existence. The most astute manufacturers are not those whose mills pay the lowest wages and run the longest hours, a fact often stated by southern and New England manufacturers of the greatest ability. The melding of New England and southern cotton mill interests has been more successfully pursued in the past ten years than many men appreciate, and it has not come about through national legislation nor by anything save a common business interest in markets common to both.

Ultimately, the mills that try to keep on making goods when all others must stop, will have their own troubles with finances, with merchandising, and with other things affected adversely everytime over-competition is forced. Just at this time the shrewdest New England manufacturers are not trying to force competition as hard as they may in

mid-winter, or when it becomes apparent that the purchasing power of the country is on an upward rather than a downward, or barely stable plane.

It is the belief of manufacturers in this section that it will be some time yet before the consuming demand for cotton goods will be large enough to take care of all the goods that can be produced. They believe that things are finally working in the right direction. They point to the certainty that the tariff will not be lower, at least, that railroads, builders, and shippers are beginning to see lower wages ahead and more employment, that the steel industry is finally attempting a long delayed revision, and that crop prospects are, on the whole, favorable from the viewpoint of future food cost. They look upon these things as making for better business.

A most recent development of vital importance, they say, is the recurrence of a moderate export demand for goods that are much needed. They do not expect a very large export business but it is their belief that at least eight per cent of the country's production will be sold for export in the next five months and that will be eight per cent more than has been sold in the past five months.

They contend that there can be no real prosperity in the industry until general industry revives and calls for a better output of cotton duck of all kinds, the many cloths and other yarns that are now required in the automobile trades, the shade cloths and other cloths wanted in buildings, the revival of demand for raincoatings, umbrella cloths, and hundreds of other cotton goods that go to industries that have been almost dormant for months. Up to the present time the best selling goods this year have been those that go into households and for dress purposes. The activity in many of these lines has been extraordinary, so much so that large corporation printers are running in full, gingham manufacturers have more than they can do, wide sheeting, sheet and pillow case factories are very busy, and bleached muslins and similar goods are not accumulating.

The great effort of experienced merchants and manufacturers now is to keep prices reasonably stable and on a low level, so that consumption will be stimulated. Opportunities to advance the prices of many goods have been passed, as in the case of printed checks, percales, ginghams, and many other cloths in vogue all over the country. Selling agents have held prices steady, and have made successful efforts to meet the varying needs in the middle of a season, instead of forcing such goods on the markets as they had planned and prepared for when the season opened. Nothing quite like the elasticity of production in New England mills has been evidenced as that seen in the past few months in changing styles in print works, finishing plants, and gingham mills. It has proven profitable and has kept the plants busy.

That stability of competition is much desired was shown by the announcement made by the Amoskeag Company this week in the matter of prices and production of spring ginghams. The buyers have wanted a larger yardage than the mills could supply in linear yards. It was, therefore, decided to offer to the trade a full line of 32-inch ginghams under the staple ginghams, and the Utility and AFC brands, widely known in retail and jobbing channels. The price basis for the 27-inch and 32-inch cloths was maintained, although manufacturers contend that the wider goods may be produced a little cheaper. In any case, the mill product is offered on the spring 1921 basis for 1922, except in the case of 19,000 range chambrays and fancies, which are ½c a yard up, and Romper and Invincible suitings, which are 1c a yard down. These changes are of little competitive importance and certainly not of a demoralizing character.

In the same way, percale manufacturers have been continuing their prices when they might have made minor revisions that would have given a little more profit in some instances and made much harder competition in other cases. It is still true that branded goods of known quality are the best sellers in the trade so that the strife for better quality in production is more general. This is less hazardous from the operative standpoint when wages are reasonably stable and employment opportunities dependent upon the care and skill of the worker.

Among many cotton manufacturers in this section the belief obtains that there is not going to be a further slump in the price of cotton this fall. Buyers of goods seem to talk that way, especially many who have come to the markets from the South and West. Manufacturers here contend that exports of cotton are now being resumed and they think money will be found to broaden them side by side with larger food exports. Moreover, they do not think cotton is dear around 12c a pound. The vital interest of manufacturers today is in so stimulating the farmer that he will take greater care in the selection and growth of good staples, and mill men say the American public will pay the bill and others will have to.

The Shambow Shuttle Company are to build a new manufacturing building in Woonsocket. Lockwood, Greene & Co., Engineers of Boston, Mass., have been retained for this work.

The National Association of Cotton Manufacturers has just issued the Cotton Mill Year Book for 1921. This publication, compiled by Alston H. Garside, statistician of the association, contains a large volume of statistical material covering all phases of the cotton industry from the growing of the raw material to the distribution of the manufacture product. Among the features of the book which are attracting attention in the trade are the comprehensive statistics on prices over a period of years. These include tables showing prices of leading varieties of short and long staple cottons, of yarns and cloths in comparison with other groups of commodities, and of cloths in this country in comparison with cloths in England, India, China and Japan. Other important statistics found in the book are those dealing with wages in this country and England, cost of cotton mill building and equipment, amount of cotton mill equipment throughout the world, and production, stocks and consumption of cotton in the United States and abroad. Important developments in the industry in recent years are illustrated by graphic charts and diagrams. The 1921 Year Book carries the same title as the previous publications of this series, namely: "Standard Cotton Mill practice and Equipment," but a leaflet inserted in it announces that on account of the broadened scope of the publication, the name will be changed beginning with next year, to "Cotton Manufacturers' Manual."

Turkey Red Dyeing on Cotton Yarns

BY WILLIAM B. NANSON.

Dyeing: Additions of lime water and tannin to the dyebath are quite necessary for fiery reds as for other shades, though where light shades are under consideration less lime water is required than for darker shades. It may be stated that for a dark pink a dyebath for 100 pounds of yarn should contain only 22 gallons of lime water, whereas 33 gallons of this solution of lime are necessary for a full red. On the other hand, the quantity of tannin may remain at a fixed point throughout most depths of shades, for in these instances it is the amount of alizarine present in the dyebath that mostly controls the depth of a shade.

The dyeing is commenced with the bath at 86 degrees F.; the yarn is worked in this for half an hour, the boiling point is gradually reached during the next hour, and the dyeing is then continued for another half hour.

Clearing: This is accomplished in the kier with a soda solution of 1½ degrees Tw. For dark yellow shades it is recommended to add 2½ to 5 pounds of annatto to the clearing bath for obtaining a fuller shade. After clearing, which generally takes up 5 or 6 hours, and to clear the yarn thoroughly, the yarn, after washing and hydro-extracting, should be steeped for about one hour in a bath of tin salt at a temperature of 80 to 90 degrees F.

The final clearing operation for a dark pink dyed yarn consists in boiling for one to one and a half hours, without pressure, with 12 pounds of Marseilles soap to 600 pounds of yarn while a further addition of three pounds of annatto may be made for the yellowish shades.

Washing, hydro-extracting and drying completes the series of operations.

Should the material under treatment be composed of mule spun yarns, then a final oil soap bath should be given. For the treatment of 600 pounds of yarn, 11 pounds of Marseilles soap are dissolved in water and diluted to 77 gallons to which are added 18 pounds of *tournante* oil and one and one-half pints of ammonia to assist the saponification. The yarn is worked in this bath and then dried and aired. This final treatment improves the appearance of the dyed material both in increasing its brilliancy and its fastness to washing.

For meeting certain requirements this special process may be somewhat shortened, particularly in the matter of oiling. The four passages in oil may be dropped to three, in which case the boiling would remain the same but the three oiling operations could be arranged as follows: First oiling, 45 pounds Turkey red oil mixed with steeping liquor at 9 degrees Tw.; second oiling, 45 pounds *tournante* oil mixed in steeping liquor 10 degrees Tw.; third oiling, 45 pounds Turkey red oil mixed in steeping liquor at 9 degrees Tw. The succeeding operations would of course remain the same.

The following process of dyeing Turkey red by the old process is practiced by the writer, and is one of the best:

Boiling: Boil as recommended at beginning of the first article, i. e., to make the material thoroughly absorbent, wash, hydro-extract but do not dry.

First oiling: 66 pounds of Turkey red oil prepared without neutralizing, as given in the first article for blue shade, are added to 44 gallons of potash solution at a strength of 9 degrees Tw. The yarn, in the wet state, is worked twice in heads of two pounds each in this bath, adding 1½ pints of fresh liquor for each successive lot of two pounds of yarn. The yarn, after squeezing, is allowed to lie overnight and dried the following day, during the course of about eight hours at a temperature of 145 to 150 degrees F.

Second oiling: A bath is made up of 66 pounds of *tournante* oil and 70 gallons of potash solution standing at 10 degrees Tw., and used at a temperature of 100 degrees F. The yarn is worked in this bath in a similar manner as the first. It is aged overnight and dried slowly the next day.

Third oiling: 66 pounds of Turkey red oil are added to a bath of 44 gallons of a potash solution standing at 9 degrees Tw. The yarn is again worked and dried as previously but without ageing.

Mordanting operation: The yarn is now passed through a bath of 70 gallons of potash solution at a strength of 5 degrees Tw. at a temperature of 100 degrees F.; it is then aged overnight and dried.

Alkali steep: The yarn is steeped for two hours in a potash solution of 1 degree Tw. at a temperature of 85 degrees F. It is then hydro-extracted and dried at a temperature of 145 degrees F. The liquor expressed from this yarn is caught for further use for the initial boiling operations of other lots of yarn as it contains an appreciable quantity of oil and when used in the boiling it brings about a considerable saving in Turkey red oil; indeed it often means that instead of the 66 pounds of oil specified for the first oiling bath only 45 pounds may be required.

Second steep: The dried yarn is now steeped for two hours in a bath of water at a temperature of 87 degrees F. and then hydro-extracted.

Sumacking: For the preparation of this bath 110 pounds of ground sumac are boiled for a time in water and the yarn immersed and steeped in it overnight. During this time it usually happens that the temperature of the liquid falls to about 110 degrees F. The yarn is then squeezed in readiness for the next stage of the treatment which must be immediately, *without any delay.*

Alum mordant: 110 pounds of aluminum sulphate are dissolved in hot water, to this is added a solution of 11 pounds of soda ash and the whole well agitated for a time. The clear liquid is then drawn off and brought with cold water to five degrees Tw. The yarn is passed, in heads of one to two pounds, through this bath at a temperature of 77 degrees F. and is then allowed to lie until the next day, when it is well washed and hydro-extracted.

Dyeing: The dyebath usually contains 265 to 330 gallons of water brought to a temperature of 86 degrees F. For full reds there is added 26 gallons of lime water, 11 gallons of sumac liquor and the necessary quantity of alizarine. This latter factor depends entirely on the depth of shade and the particular tone of it that is desired, and other local conditions.

The lime water is made beforehand by adding about 33 pounds of burnt lime, first slacked with hot water, to 220

gallons of cold water. Of course only the clear liquor obtained by settling is used. The sumac liquor is made by boiling 33 pounds of leaf sumac in a suitable quantity of water, passing through a fine sieve and diluting the clear solution to 66 gallons. This quantity of sumac liquor should suffice for 6 dyeings when 100 pounds of yarn are taken on each occasion. I would say here that sumac should be used the day it is boiled. It deteriorates rapidly into gallic acid which is useless, if kept over—it is the tannic acid in the sumac that we want. The dyeing operation is carried out by working the yarn for the first half hour at a temperature of 86 degrees F., and then continue the working for an hour during a gradual rise of the temperature to boiling. It is then worked for another half hour at a boil.

Clearing: After dyeing, the yarn is boiled for five to six hours with a solution of potash under a pressure of ½ to ¾ atmosphere (8 to 10 pounds pressure) standing at 2 degrees Tw. A copper lined vessel is advised for this operation. A thorough washing follows, after which the yarn is hydro-extracted and steeped for an hour in a bath at a temperature of 88 degrees F. containing three pounds of tin salt and again hydro-extracted.

Second clearing: In the same or a similar vessel to that used in the last operation, the yarn is now boiled for 1½ to 2 hours in a solution containing 14 pounds Marseilles soap, under a pressure of ½ atmosphere. It is finally washed, hydro-extracted, dried and aired (cooled off).

Another Red Shade With Sulpholeate.

Forty pounds of best castor oil are mixed gradually and without the development of much heat with 5½ pounds of sulphuric acid in a pot holding 6½ gallons. The pot is placed during the mixing in a vessel filled with cold water and allowed to remain so until the oil gives a clear solution with potash and ammonia. This requires about two days in summer time and about three or four or more days in winter. The acid oil thus obtained is used without washing or neutralizing.

First oiling (green liquor): This bath is used continuously and freshened up with 48½ pounds of the foregoing acid oil, 11 pounds of ammonia and four gallons 7½ pints of a solution of carbonate of potash at 52 degrees Tw. In making the starting bath, 2½ times these quantities are necessary. The yarn is oiled in this liquor at a temperature of 104 degrees F., and then dried in a dry room heated to 155 degrees F. during eight to ten hours.

Second oiling is like the first.

Third oiling: This is done in a standing bath with 44 pounds acid oil and 9 gallons 4½ pints potash solution (or correspondingly more in a fresh bath). Dry as before. This oil bath is much more alkaline than the two preceding, and, therefore, has a stripping effect but at the same time it exerts an oiling action.

Steeping: The yarn is placed for eight hours in water of the temperature 86 to 90 degrees F. It is then hydro-extracted and dried as before. The liquor drained from the yarn amounts to about 200 gallons; it stands at about 2 degrees Tw. and contains much oil and may be used to good advantage to dilute the oil baths and in the boiling of the yarn.

Mordanting: This bath is also used continuously freshened up with 110 pounds aluminum sulphate, 9⅓ pounds of soda crystals in solution, 9⅓ pounds of chalk, and 2¼ pounds of tannic acid. The whole is well mixed, and the clear solution, drawn off and diluted to 6 degrees Tw., is used for the mordanting. The dry yarn is put evenly into a vat (wooden) and the foregoing mordanting liquor is run over the yarn, so as to cover it, and then, without working, is allowed to act on it for 15 to 20 hours. The liquor is then drawn off for future use and the yarn well rinsed, but in order to avoid unevenness it is not hydro-extracted and the yarn is not dried.

Dyeing: The dyebath is prepared, for 100 pounds of yarn, with about 14⅓ pounds of alizarine and 3½ ounces of tannic acid and, in the case of water which contains no lime, ½ to 1 pound of ground chalk. The mordanted, wet yarn is turned for one hour cold, the bath is then heated gradually to a boil during the course of 1½ hours when the yarn is put under the surface of the liquor and the boiling continued for one hour more.

First clearing: Three hours boiling at 20 pounds pressure with the addition of 6½ to 9 pounds of soda, followed by rinsing.

Second clearing: Four hours boiling at 20 pounds pressure with 17½ pounds of neutral soap, 2 pounds of soda and 14 ounces of tin crystals, followed by rinsing and drying in the air.

This last process yields a very fast bright red which is, next to the old process, an excellent red.

I would say here that all clearing processes must be conducted in a copper vessel—anything iron will give a purple hue and dullness to a Turkey red. Iron in the water used at any stage is fatal to good results.

New Turkey Red Process.

This process yields beautiful reds, which are, however, not quite so fast as those obtained by the previous processes.

Turkey red oil, prepared from castor oil, is most generally used; sulphated olive oil can be used, or cotton seed oil, but they have not proven so good as they do not oxidize or polymerize as readily. Very fair results may be obtained with a carefully prepared castor oil soap, i. e., sodium ricinoleate, but this is not advised. The reason why castor oil soap, now frequently applied instead of Turkey red oil, produces inferior results, is to be found in the fact that the solution of the soap is much more frothy than that of the neutralized sulphated oil; and chiefly, because the dyed material shows the flat and dirty shade of the alkali alizarate. This last fact is explained by the suggestion that in mordanting with alumina a waterproof envelope of ricinoleate of alumina is formed externally on the fiber, thus enclosing the nucleus of the alkali soap.

This so-called "new red process" is one that finds much employment now-a-days, the main feature of difference between it and the so-called "old process" arising from the fact that the clearing after dyeing is accomplished by a process of steaming instead of soaping. Besides this distinction the process is a much shorter one. In any case, the shades obtained naturally admit of no comparison, in most ways, with those produced by the old and longer process. The shades resulting from the new processes are, however, usually brighter, though by no means as fast and they do not as satisfactorily withstand milling and bleaching.

Boiling: For 600 pounds of yarn, the yarn is first boil-

Barrett Specification Roofs

Bonded for 20 and 10 Years

Milwaukee Favors Barrett Specification Roofs—

WITH its splendid park and boulevard system, its handsome residential districts, and its picturesque location on the gracefully jutting shores of Lake Michigan, Milwaukee is one of the most attractive cities in America. It is also one of the busiest.

And, as in the other principal cities of the country, a large percentage of Milwaukee's modern permanent buildings are covered with Barrett Specification Roofs.

The Barrett Specification provides for the use of roofing materials of uniformly high quality, applied in proper quantities and by approved methods.

The Barrett Inspection Service insures strict compliance with the Specification.

The Free Surety-Bond Guaranty, issued by the U. S. Fidelity and Guaranty Company of Baltimore, absolutely protects the owner from upkeep expense for 20 or 10 years.

Moderate first cost, unequalled durability, and no upkeep—these combine to make Barrett Specification Roofs by far the most economical roofs for all flat-roofed buildings.

The Barrett Specification Type "AA" 20-Year Bonded Roof represents the most permanent roof covering it is possible to construct, and while we bond it for 20 years only, we can name many roofs of this type that have been in service over 40 years and are still in good condition.

Where the character of the building does not justify a roof of such extreme length of service, we recommend the Barrett Specification Type "A" Roof, bonded for 10 years. Both roofs are built of the same high grade materials, the only difference being in the quantity used.

Before specifying or closing contract for a Barrett Specification Bonded Roof, read carefully all the stipulations in the specification.

The Barrett Company

New York	Chicago	Philadelphia	Boston	St. Louis	Cleveland	Cincinnati
Pittsburgh	Detroit	New Orleans	Birmingham	Kansas City	Minneapolis	Dallas
Nashville	Syracuse	Seattle	Peoria	Atlanta	Duluth	Bangor
Salt Lake City	Washington	Johnstown	Lebanon	Youngstown	Milwaukee	Toledo
Columbus	Richmond	Latrobe	Bethlehem	Elizabeth	Buffalo	Baltimore
Omaha	Houston	Denver	Jacksonville			

THE BARRETT COMPANY, Limited

Montreal	Toronto	Winnipeg	Vancouver	St. John, N. B.	Halifax, N. S.

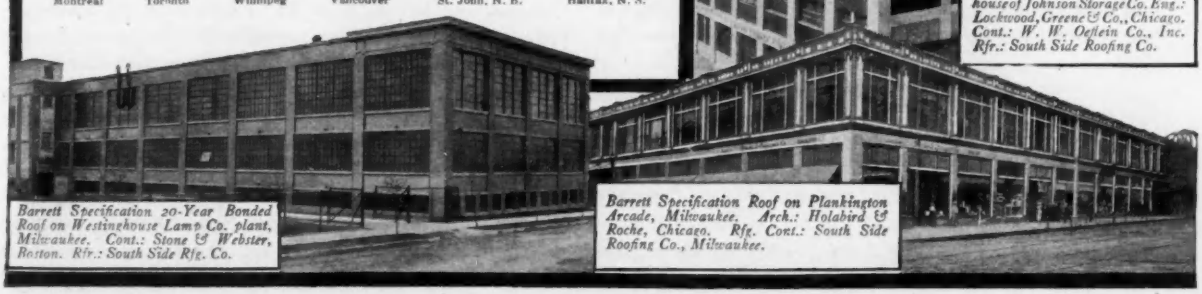
Barrett Specification 20-Year Bonded Roof on Bldg. of Phoenix Knitting Works. Arch.: A. C. Uehling, Milwaukee. Gen. Cont.: Hanson Construction Co., Milwaukee. Rfg. Cont.: South Side Roofing Co., Milwaukee.

Barrett Specification Roof on Building of Johnston Soap Co. (Home of Palmolive). Eng.: Lockwood, Greene & Co., Chicago. Gen. Cont.: Walter Oeflein, Milwaukee. Rfg. Cont.: South Side Roofing Co., Milwaukee.

Barrett Specification 20-Year Bonded Roof, Hummel & Downing Box Co. Arch.: A. C. Uehling, Milwaukee. Cont.: Hanson Const. Co., Milwaukee. Rfr.: South Side Rfg. Co., Milwaukee.

Barrett Specification 20-Year Bonded Roof, Wisconsin Food Products Co. plant, Milwaukee, Wis. Eng.: A. W. Hoffman, Milwaukee. Cont.: W. W. Oeflein, Inc., Milwaukee. Rfr.: South Side Rfg. Co., Milwaukee.

Barrett Specification Roof on warehouse of Johnson Storage Co. Eng.: Lockwood, Greene & Co., Chicago. Cont.: W. W. Oeflein Co., Inc. Rfr.: South Side Roofing Co.



Barrett Specification 20-Year Bonded Roof on Westinghouse Lamp Co. plant, Milwaukee. Cont.: Stone & Webster, Boston. Rfr.: South Side Rfg. Co.

Barrett Specification Roof on Plankington Arcade, Milwaukee. Arch.: Holabird & Roche, Chicago. Rfg. Cont.: South Side Roofing Co., Milwaukee.

ed for about five hours under 15 pounds pressure, in a solution of caustic soda at a strength of 1½ degree Tw., and 10 pints of Turkey red oil. It is then washed and hydro-extracted.

Oiling: The Turkey red oil for this purpose may be a suitable commercial sulpholeate (or alizarine assistant) or it may be prepared by the dyer by adding 14 pounds of sulphuric acid 168 degrees Tw. slowly to 66 pounds of castor oil, stir constantly and keep cool. After stirring well the mixture is allowed to stand for three hours and then for a further 48 hours in a warm room. It is then added to 25 gallons of warm water and the whole allowed to stand for another 48 hours when three gallons of ammonia and 1½ gallons of water are added. This oil should form a clear solution with water.

For oiling the yarn: 110 pounds of this Turkey red oil are added to 29 gallons of water at 100 degrees F., to which is made the further addition of 29 ounces of stannate of soda dissolved in 2½ gallons of water. It may be mentioned that the addition of stannate of soda is usually only made when a sodium ricinoleate compound is used, for in the presence of any excess of ammonia a hydroxide of tin is formed which falls down as a precipitate.

When the yarn has been passed twice through the oil bath it is dried by hanging for eight hours in a room heated to 155 degrees F.

Mordanting: Dissolve 110 pounds aluminum sulphate in 55 gallons of water; mix thoroughly eight to ten pounds of chalk in seven gallons of hot water; the latter is then added gradually to the former solution under constant agitation. This mixture is allowed to rest until the next day when the clear liquor is drawn off and neutralized with 22 pounds of soda and 20 gallons of hot water. Finally, there is added 3½ gallons of acetic acid at 9 degrees Tw. which must be free from the presence of iron, and the mordant is ready for use when it is quite clear. The yarn is then passed through the bath, squeezed, hydro-extracted and dried at a low temperature of about 85 degrees F. for a period extending over 48 hours.

Fixing: The dried yarn is then subjected to treatment in a bath prepared for 600 pounds of yarn by adding 66 pounds of chalk to 77 gallons of hot water, afterwards the yarn is slightly squeezed and allowed to lie in this state for about one hour, then well washed and hydro-extracted.

Dyeing: The necessary quantity of alizarine is placed in the dyebath, and the yarn worked in it for one hour, during which the temperature is raised to 145 degrees F. At this point the yarn is temporarily removed from the bath and 7 pounds of Turkey red oil added. After a thorough stirring the yarn is re-entered and worked for ¾ hour while the temperature is brought up to 156 degrees F. The dyed yarn is then washed, dried and steamed for four hours under a pressure of 15 pounds. The yarn is then passed through a boiling soap bath, washed, dried and aired.

There are other methods pursued by different dyers for dyeing Turkey red by the new process: The boiled and washed yarns are hydro-extracted but not dried and are then worked in a bath containing about 40 pounds of neutralized Turkey red oil (50 per cent commercial) for every 10 gallons of water. When thoroughly saturated with the liquor they are evenly wrung out. They are then dried at a temperature varying from 104 to 140 degrees F. For the production of a bright and intense red, the operations of oiling and drying and subsequent aluming are repeated once or twice. Sometimes the oiled goods are steamed under a pressure of 8 pounds for 60 to 90 minutes, this makes for brightness and fastness but is not essential.

The compounds constituting the Turkey red oil are decomposed by the operations of oiling, drying, ageing and steaming; ammonium or sodium sulphates and various organic acids being formed. The latter are similar to the corresponding substances deposited in the fiber in the old processes and consist of products of the oxidation and polymerization of ricinoleic acid, etc.

Aluming: The goods are worked for five to six hours in a warm bath (104 to 112 degrees F.) of red liquor at 10 degrees Tw., or of basic alumina sulphate and wrung out and dried at 104 to 112 degrees F.

Chalking: This resembles the treatments in the other Turkey red processes already given by which the material is worked in a weak alkaline bath for the purpose of purifying it from an excess of oil; in this process, however, the purification takes place after the aluming, so that not only is there a removal of the excess oil, but also a more complete precipitation of the alumina which has been absorbed during the aluming. A chalk bath is generally used for this purpose. Brighter colors are said to be produced when phosphate of soda or ammonium carbonate are employed as fixing agents. Arsenate of soda gives still brighter shades than the phosphate.

The yarn is worked for 30 minutes at 86 to 104 degrees F. in a bath containing one pound of ground chalk for every 10 gallons of water; it is then thoroughly washed and dyed without drying.

Dyeing: Eight per cent alizarine 20 per cent is generally used. The different shades of Turkey red can be produced by combining the blue and yellow shades of alizarine in various proportions; ten per cent of acetate of lime 29 degrees Tw. and one per cent of tannic acid (both calculated on the amount of dyestuff used) should be added to water which shows a hardness of 7½ degrees.

The yarn is worked in the cold dyebath for ¼ hour. The temperature of the bath is then raised during one hour to 194 degrees F. and the yarn is worked at this temperature for ½ hour. After dyeing rinse immediately, hydro-extract and dry.

More brilliant shades are obtained by the addition of two per cent Turkey red oil (50 per cent) (calculated on the weight of the yarn) to the dyebath.

Steaming: Steam in a cottage steamer for two hours at a pressure of 22½ pounds.

Soaping: In order to obtain a pure red the yarn is now boiled for one hour in a closed vessel (copper) with two parts of soap per 1,000 parts of water, finally washed and dried at a low temperature. Reds of greater brilliancy and fastness are obtained by boiling the yarn for two hours at a pressure of 30 pounds with two parts soap, 0.3 parts soda ash and 0.1 part tin salt per 1,000 parts water.

While the writer is not the originator of the foregoing *new* process, it is, with various modifications to suit different conditions and styles of goods, the method he has always used, and I might say here that all processes given in this article are compiled from methods in actual and successful use and I have given several methods used by different parties in both the old and the new processes. The methods adopted vary, of course, with the nature of

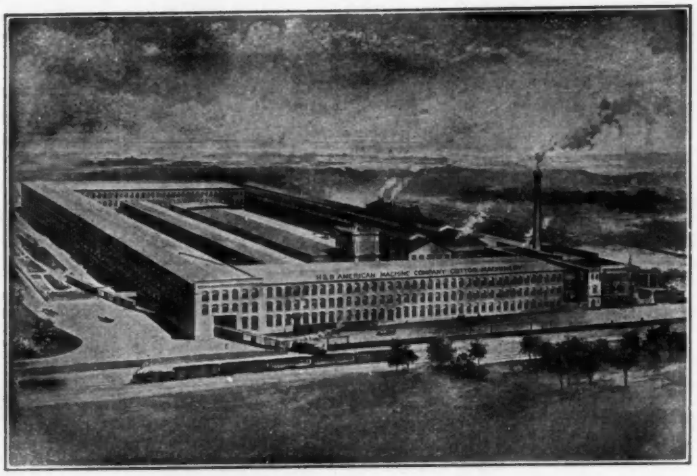
H & B AMERICAN MACHINE COMPANY

PAWTUCKET, R. I.

Southern Office Atlanta Trust Co. Bldg. Atlanta, Ga.

Opening and Picking Machinery

Card Room Machinery



Spinning Machinery

Twisters for Wet or Dry Work

With Band or Tape Drive

COTTON MACHINERY

the goods and the result required and to a certain extent with the locality, the water, and the peculiar personality of the dyer, therefore, those given in this article must be regarded only as examples of what other men are doing, and not as standard methods incapable of variation.

Dr. Matos, in the *Dyer and Calico Printer*, suggests the following method for a new Turkey red: The cotton is boiled out as usual, and washed and dried. It is then oiled in a solution of Turkey red oil, 5 gallons of oil (50 per cent), 10 gallons of water; hydro-extract and dry during eight hours at 110 to 115 degrees F. Pass through a bath of acetate of lime at 6 to 8 degrees Tw. and again dry. This acetate of lime treatment is the foundation of a good fast red, and if the cotton is not mordanted at this stage properly, good results will not be obtained.

After coming from the drying room, the yarn is chalked for about one hour in a bath containing 10 pounds of chalk, kept in suspension by agitating, and heated to 140 degrees F., after which it is washed well, to remove all free chalk particles. This is also very important, since any loose chalk, mechanically adhering to the cotton fibers, is a sure cause of lack of fastness to rubbing.

From the chalk bath, the yarn goes to the dyebath, which is prepared with about 8 per cent of alizarine (dry basis) 3 per cent Turkey red oil and 1 per cent sumac (or equivalent of tannic acid). Dyeing begins cold, the temperature is gradually increased to 150 degrees F, and maintained at this temperature or at most 160 degrees F. for half an hour. Lift the yarn, hydro-extract and dry without excessive heat.

After dyeing, the yarn is steamed for one hour at 25 pounds pressure. Soaping is the last operation. The steamed yarn is usually soaped in a kier under low pressure with 3 per cent of soap fortified with a small amount of soda, and to which some dyers add a small amount of tin crystals; seldom exceeding 1 per cent.

Cotton subjected to this process is thoroughly dyed, the color is full and rich, and will not crock.

This process may be modified as follows: The yarn is boiled and oiled as the other, and the oiling and drying repeated for a second or even a third time. After the final drying it is steeped in a cold solution of alum for five minutes and then rinsed. Hard twisted yarn requires a longer immersion.

In the meantime, the dyebath is prepared by adding successively 12 per cent alizarine (20 per cent paste), one per cent acetate of lime, 2 per cent tannic acid, ¼ per cent acetic acid.

Dyeing starts at ordinary temperature but is gradually raised to 180 degrees F., dyeing progressing at that temperature for one hour.

Afterward the yarn is washed, dried and steamed for two hours at a pressure of 25 pounds and finally soaped. Repeated steaming and soaping increases the brilliancy of the shade. Yarn dyed by this process resists light and most severe washing, together with the ordinary laundry bleach, and in consequence is much employed for towel headings and yarn for table cloths.

Real Turkey red dyeing is a long process, but like all shades requiring the use of dyewares having a heavy chemical molecule to produce, it is well worth the time. Indeed, the longer the time taken, the denser the color compound

Signs of the Times

Since January 1, 1921, bills authorizing public ownership of utilities—similar to those now pending in Georgia—have been introduced in the Legislatures of four States, with the following results:

In February, Oregon,
In March, New York,
In April, Maine, and
In May, California

Decisively defeated such legislation.

In no state has legislation of this character been successful.

With the exception of New Hampshire, Vermont and Connecticut, **every** State expressly forbids the incurring of debt to the extent, or for the purpose, named in the public utility measures now pending before the Legislature of Georgia.

Georgia Railway & Power Co.

on the cotton becomes, and as a natural consequence the final fastness of the shade.

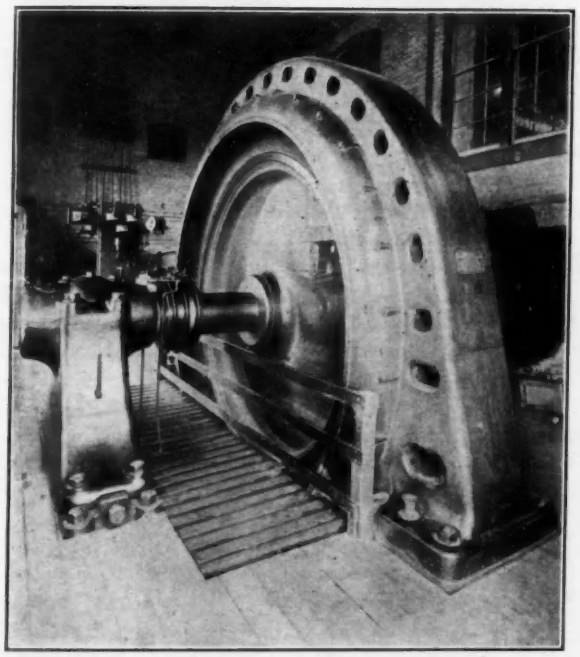
Water, free from lime, i. e., soft water, must be used on all operations except the actual dyeing operation, which requires lime as one of its constituents, and it is of the utmost importance that iron as an impurity should not contaminate the work at any stage, since alizarine readily forms iron compounds which tend to dull the shade.

[This is the second and last of a series of two articles on Turkey red dyeing.]

Old Time Equipment Still in Use.

Owing to the rapid development of electrical apparatus during the past thirty years, some varieties only five years old might, perhaps, be classed as museum pieces, while those ten years old or more are almost forgotten. This makes the motor, generator, and switchboard in a textile mill at Pelzer, S. C., interesting from two standpoints, first, they were installed about 1895, twenty-six years ago, and, secondly, they have been running continuously ever since.

All three are of General Electric Company manufacture,

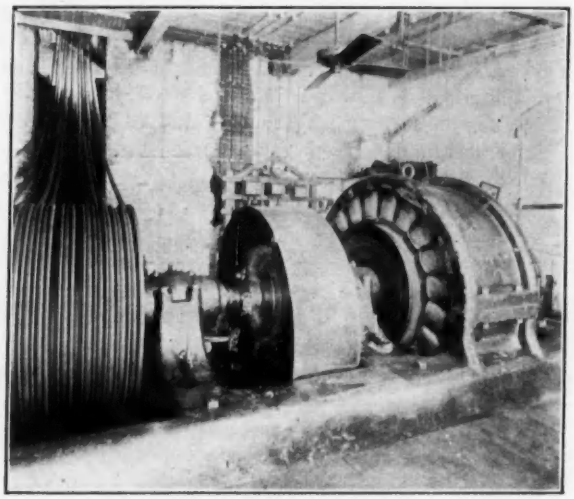


THE AB 3450 VOLT SYNCHRONOUS GENERATOR WHICH HAS BEEN USED AS A MOTOR AND A GENERATOR.

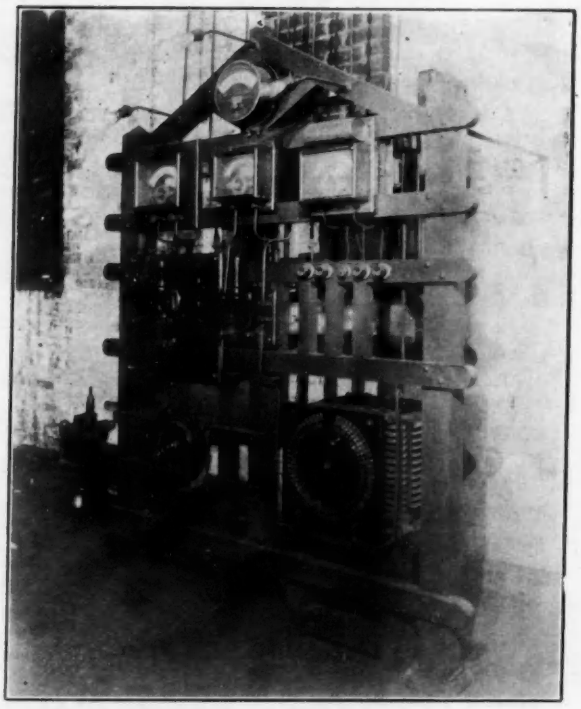
the generator being an AB 3450-volt, 120-amp., 180 r.p.m. synchronous machine, which has been used as both a motor and a generator. The synchronous motor is a type AF, 400 hp., 3000 volt, 360 r.p.m. machine which has been used as a motor since 1897. The switchboard is an old wooden slat affair, with the original meters and resistances still on it. The only change made in it is that formerly the resistance was mounted with the handles on a bench, so that the operator could sit between the two and operate them. The bench has now been removed, and the handles placed on the boxes.

The whole outfit is an example of the primitive operating practices of those days. The generator was put on the line by the old dim-and-glow lamp system, and as the result of the lamps being improperly connected, for eight years it was thrown on the line out of step, three single blade knife switches being used to throw it on. The motor starts direct on line voltages, without the use of a commutator.

In spite of the vicissitudes of service the old machines



SYNCHRONOUS MOTOR, TYPE AF, 3000 VOLTS, 60-CYCLE, INSTALLED AT THE PLANT OF THE PELZER MFG. CO. IN 1895 AND USED AS A MOTOR SINCE 1897. SOON TO BE USED AS A GENERATOR.



SWITCHBOARD USED TO CONTROL SYNCHRONOUS MOTOR. IT IS AN EXAMPLE OF WHAT SWITCHBOARDS AND INSTRUMENTS WERE LIKE 25 YEARS AGO.

are still in good condition. No coils have been replaced on the generator or motor since 1895, nor have any other except very minor repairs been necessary. The Pelzer Manufacturing Co., owners of the apparatus, plan to use the motor as a generator to supply power for the individually motor driven machines in their factory.

Notes About Men You Know.

ALBERT G. SMITH, representative in Georgia, Alabama and the Southwest for the Corn Products Refining Company, is receiving the congratulations of his friends upon his marriage to Miss Ethel Johnson Gardiner, daughter of Mr. Joseph Gardiner, on Thursday, July 14, at the Church of Transfiguration, New York City.

A. M. BURT, formerly manager of the Kincaid Knitting Mills, Griffin, Ga., has accepted the position of manager of the Rocky Mount (N. C.) Hosiery Mills.

A. C. ATKINSON, who for ten years has been assistant superintendent and general overseer at the Liberty Cotton Mill Co., Clayton, N. C., has resigned and accepted a position as overseer of spooling, winding, twisting, warping and finishing at the Sterling Cotton Mills, Franklinton, N. C.

E. D. DOBY has been made overseer of spinning at the Marsh Cotton Mills, Salisbury, N. C.

R. F. GARDNER has been appointed superintendent of the Klumac Cotton Mills, Salisbury, N. C.

W. N. WILLIAMS recently became superintendent of the Laboratory Mill, Lincolnton, N. C. He was formerly connected with the Williams Mill, of the same place.

L. C. LOVELL has accepted the superintendency of the Dillon (S. C.) Mills.

D. E. MCGLOUN has been made superintendent of the Gate City Cotton Mills, College Park, Ga.

J. H. MAYES, of Charlotte, has been elected president and treasurer of the Grace Cotton Mill, Rutherfordton, N. C.

F. B. PORTER has accepted the position of superintendent at the Cohannet Cotton Mills, Fingerville, S. C. He succeeds M. L. Burton.

J. H. MCKINNON has been made superintendent of the Pickett Cotton Mills, at High Point, N. C.

L. A. PROCTOR has accepted the superintendency of the Wilson (N. C.) Knitting Mills.

T. B. LEWIS has resigned as superintendent of the Acworth (Ga.) Cotton Mills. He is succeeded by M. E. Riley.

V. A. HOWARD has accepted the position of superintendent of the Catawba Spinning Co., Mt Holly, N. C.

J. P. HENDERSON is manager Miller Cotton Mills, at Waco, Texas, instead of superintendent, as stated last month. G. C. May is superintendent.

L. M. DUVALL has succeeded C. Shaner as superintendent of the Wardlaw Hosiery Mills Co., Chattanooga, Tenn.

W. A. MORLEY has been promoted from the position of assistant superintendent to that of superintendent at the Rankin Mills, Gastonia, N. C.

T. C. GORE has resigned as superintendent of the Avondale Cotton Mills, at Humboldt, Tenn., and D. T. Bagwell, superintendent of the Columbia (Tenn.) Mills, has become superintendent of the Avondale Cotton Mills also, succeeding Mr. Gore.

J. H. CROSBY has been made overseer of carding at the Augusta (Ga.) Factory.

W. P. LEE has resigned as superintendent of the Rankin Mills, Inc., and the Ridge Mills, Inc., and will devote his time to the superintendency of the Pinckney Mills, Inc. All these mills are located in Gastonia, N. C.

GEORGE W. GRICE, who has been superintendent of the Catawba Spinning Company, Mt. Holly, N. C., has accepted the superintendency of the Globe Yarn Mills, Inc., at Mt. Holly.

P. A. CHESTER has been promoted to overseer of carding at the Pinckney Mills, Inc., Gastonia, N. C.

C. C. RIDDLE has been made superintendent of the Dixie Cotton Mill, Mooresville, N. C.

W. S. GRIFFIN has been appointed superintendent of the Parker Hosiery and Dye Works, Portsmouth, Va.

C. W. BAILEY has accepted the position of overseer of weaving at the Columbia Cotton Mills, Columbia, Tenn. He was formerly at Selma, Ala.

R. T. GRANT, the well known southern manager of the United Chemical Products Corp., has gone to Buffalo Springs, Va., to spend several weeks on account of ill health.

E. E. CROOKE, of Boston, has taken charge of the traffic departments of five southern mills of Lockwood, Greene & Co. Mr. Crooke will make his headquarters at Winnsboro, S. C. The mills are the International Cotton Mills at La Grange and Hogansville, Ga.; the Addison Mills at Edgefield, S. C.; the Wateree Mills at Camden, S. C.; and the Winnsboro Mills, at Winnsboro, S. C., where Mr. Crooke will be located.

FRANCIS E. HYDE has resigned his position with the Adams Manufacturing Co., North Scituate, R. I., and has accepted the position of night superintendent at the Nyanza Mills, Woonsocket, R. I.

D. RAYMOND HINKLE has resigned his position as superintendent of Mill No. 1 of the Cedartown (Ga.) Cotton & Export Company, and has accepted the position of superintendent at the Kinston (N. C.) Cotton Mills.

A. C. CANTERBURY, who has been overseer of carding, spinning and winding at the Alden Mills, Meridian, Miss., has resigned and has become overseer of spinning at the Eva Jane Mills, Sylacauga, Ala.

W. M. SOUTHERN has resigned as overseer of carding and spinning at the Kings Mountain (N. C.) Manufacturing Co. He is succeeded by D. E. Mahaffee.

T. E. WHITE has been made overseer of dyeing at the Brogon Mill, Anderson, S. C.

OWEN FITZSIMMONS, secretary of the Clover Mills Co., Clover, S. C., is to be married next winter to Miss Lily Joy Draper, daughter of Arthur J. Draper, of Charlotte, according to announcement made by Mr and Mrs. Draper.

The Textile Color Card Association of the United States, Inc., 315 4th Ave., New York City, has issued the 1921 fall season color card of America. The season cards show standardized colors forecasting each season's color development and the 1921 fall season card shows colors in evening shades, shoe leather, hosiery colors and woolen colors. It also contains a list of members of the Association.

Time was when you liked to take a chance on a lucky packet, but you do not use that method in business.

Warren Soap and Warren Service combine the accumulated experience of a large part of the textile trade during fifty years with the most up-to-date scientific investigation.

The Warren Soap Manufacturing Co.
77 Summer Street, BOSTON, MASS.
Established 1870 **Incorporated 1890**

STRAIGHT LINE METHODS

Competition

Competition is the impelling force in business. It proves every enterprise—eliminates the weak, rewards the strong. It compels new ideas, better methods, greater efficiency. It sets the highest standards for success.

Successful competition is the ability to exchange a desirable product or service at a fair profit. Exchange without profit is loss. Inability to offer the same value as competitors is a handicap. Under exacting conditions such loss and handicap is failure.

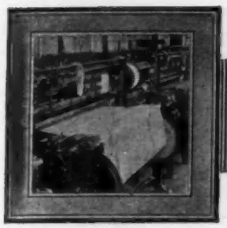
In competition, *knowledge of your business is power to win.* Timely and dependable facts and figures from every department, obtained thru the application of sound methods of cost accounting, give exact costs and overhead, and establish the basis of fair profit. They reveal inefficiency, weakness and waste. Knowledge, and the practice, of better methods eliminate these; and the bugaboo of competition disappears.

ERNST & ERNST

AUDITS - SYSTEMS
TAX SERVICE

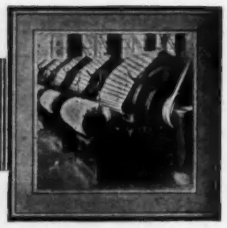
NEW YORK	CHICAGO	CLEVELAND	CINCINNATI	NEW ORLEANS
PHILADELPHIA	MINNEAPOLIS	BUFFALO	INDIANAPOLIS	DALLAS
BOSTON	ST. PAUL	PITTSBURGH	TOLEDO	FORTH WORTH
PROVIDENCE	ST. LOUIS	DETROIT	ATLANTA	HOUSTON
WASHINGTON	KANSAS CITY		RICHMOND	DENVER

STRAIGHT LINE METHODS



How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects



We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

A Mill Problem for Discussion.

EDITOR COTTON:

If a mill is hung up so that it is making 9½'s yarn from 1-inch Middling, double roving, with 1⅝-inch ring and 7¼-inch traverse, would a number 1 or number 2 flange ring give the best results, and what style and circle traveler would you recommend with this flange, considering that we desire to insert 9½ turns of twist per inch?

C. S. W. (Mass.)

What Is the Best Card Draft?

EDITOR COTTON:

Again taking up the thread of the subject of the elimination of troubles in yarn manufacture, the next operation to discuss is that of the action of the licker-in upon the cotton being held by the feed roll and resting against the face of the feed plate.

There are many different versions of the correct speeds at which to operate the licker-in, also there are many versions as to the relative speed of the feed roll to that of the licker-in. The shape of the so-called nose of the feed plate plays a great part in the general action of the cleaning process.

Some people have the idea that there must never be any action taken by them toward the changing of the relative speeds between the feed roll and licker-in, and there are many carding departments that suffer tremendously because of this inattention. The general method of adjustment is to retain a draft of from 95 to 100 or 124 inches. This, claim some mill men, being determined by the length of staple and grade of cotton being used, and I find upon inquiry that there is no other reason than this one for the amount of draft used in many cases. I find that very few men have even ventured beyond 124 inch draft and that its worth has never been determined by a great many men. One man claimed that to lengthen a draft over 95 inches weakened the yarn to a terrible degree; another claimed that to operate a card at 95-inch draft would be suicidal to the mill's career; he also added that a draft should never be above 125 inches but when asked his reason for this statement, he said, "Well, I can't just exactly tell, but I have never been above that length."

These statements, coming from the type of men who represent the average carding room man, go to show that the average man has simply applied himself to the shoes of his tutor and accepted everything that the latter advised as final in manufacturing. If we will but reflect a moment to decide once and for all just what the general theme of the whole process of manufacturing means, just what takes place in the whole operation in order to draw the bulk of cotton to the fine or coarse yarns as desired, we can reach but one conclusion as to the purpose of the operation, and that will be—paralleling or straightening the fibers against one another. This covers the whole theme, for by so doing, the cleanliness is automatically taken care of.

In order to straighten out the fibers they must be drawn and combed. The length of the staple determines the length or distance to draw while the polishing and cleaning of the yarn is taken care of by the combing process. After this operation has been successfully performed in the picking process, the next (and in the case of carded yarns the last) cleaning operation surely takes place in the card, and by all means must be finished properly by that machine or doom is written upon every inch of yarn that is finished.

In order to get the yarn in an acceptable condition, the relative speeds of the feed roll to the licker-in must be taken into consideration. If we allow the feed roll to be operated fast, which is the case when we apply a short draft to the whole machine, we increase the strain upon the wire of the cylinder to a terrible degree, for by feeding a bulk against the cylinder means to crowd a large bulk between the back plate and the points of the wire on the cylinder, and it is there that many cylinders are loosened and many card rooms ruined because of this terrible strain upon the fabric of the clothing.

Just, for instance, let us take into consideration the action of a piece of steel shafting that has become out of true in its revolution. We all realize the action that takes place upon the fiber of that steel upon every revolution, of course, and in the long run do we not find that shaft crystallized and broken? If that is true of a piece of steel just what must be expected of a fabric composed of cotton and wool (and rubber in some cases)? Will they withstand the hard usage given them by a short drafted card day in and day out without weakening even to the breaking point? Think for a moment of the crowding by the back feed plate of the tremendous bulk, as is the case when a 95 inch draft is applied, especially when that is combined with a fairly heavy lap of say 13 or 14 ounces per yard. Can you imagine the tremendous strain taking place between the plate and the wire?

Just for a moment, let us place our imagination upon

THE NEWPORT COLORS

For Cotton and Cotton and Silk

The Best Developed Blacks
Newport Developed Black 2 B N
NEWPORT FAST BLACK V
(Zambesi Black V)
Fast, Bloomy, Intense.
Alike on Cotton and Silk.

NEWPORT
TRADE MARK
"COAL TO DYESTUFF"

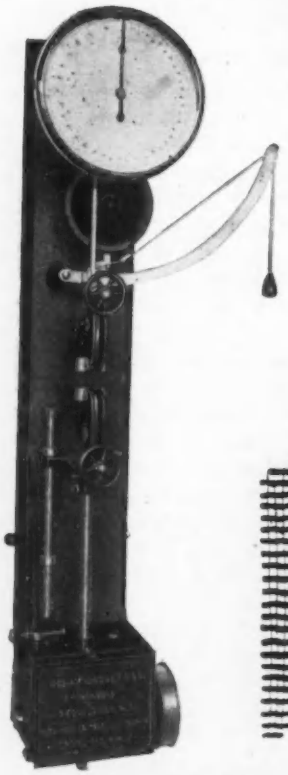
NEWPORT CHEMICAL WORKS, Inc.
PASSAIC, NEW JERSEY

BOSTON, MASS.
PROVIDENCE, R. I.

Branch Sales Offices.
GREENSBORO, N. C.

PHILADELPHIA, PA.
CHICAGO, ILL.

Scott Testers



CONSIST of an extensive line of machines suitable to all kinds of testing. For use in analytical work and routine checking of the mill production, they are the best testing machines ever produced, the easiest and quickest to handle and the accuracy of the results are beyond question. We refer to any of the authorities on textiles, the government departments, and the trade in general. Testing apparatus is not expensive and soon pays for itself in many ways.

May we send you a catalog?

HENRY L. SCOTT & CO.
PROVIDENCE, R.I.

the action that takes place when the feed roll has been made to run much slower with the same weight lap assuming that the licker-in speed has been allowed to remain at the same speed. We can readily see that the bulk of fibers presented to the surface of the licker-in is exactly the same weight, but because the feed roll is operating at a much slower speed, this automatically controls the quantity of fibers to be released by the combing operation of the licker-in surface. This action being controlled by the longer draft of the whole card prevents the bulky flakes from being detached and thrown against the cylinder to be matted between the back plate and the wire, does it not?

Now, again, if the flakes have been removed by this operation, just what action is assisting in the operation? Are we not combing each fiber more by the slow operation? And if that is allowed are we not cleaning and polishing that fiber just that much more than heretofore?

Cleanliness and strength are two things that are sought. Can the open mind conceive the two in this one change in operation? The bulk of cotton being held directly between the lower center of the feed roll and the upper surface of the feed plate assures the experimenter that no fiber can possibly be broken or chafed, for after the feed roll has revolved sufficiently to have allowed the lengths of each fiber to have passed its center, there is nothing that keeps that fiber within the tuft of cotton presented to the licker-in surface but frictional contact with the next fiber and that alone assures the safety of it.

The action of the licker-in upon this fiber is wholly controlled by the length of time that fiber can stay within the mass, so now, if a greater mass of cotton is applied, or in other words, a heavier lap is applied to bring back to normal the weight of the sliver to what it was previous to slowing down the feed roll, are we not retaining that fiber longer within that mass and are we not cleaning all the foreign matter from its surface? It surely is safe to say that at least that would be the principle of such an operation.

Assuming this to be true, what have we gained? The web itself is evener because more fibers to the inch gives the assurance of evener yardage; the feed roll handles the extra cushion to better advantage; the fiber is being detained longer during the operation of being drawn out from the mass by the licker-in, giving us a more lustrous fiber because of frictional contact with other fibers, and a cleaner one because of the action of the licker-in against the length of time the fiber has been detained, giving us the assurance that the cotton has been taken in fiber form to the cylinder instead of in flakes, thereby saving our wire on both cylinder and flats.

Now if this operation means anything to the troubled carder, the question arises, "How long a draft should we run?" or "What length is the best?"

That is controlled by the condition derived in the picking process. If the lap web is beyond question, the carder should go to 170 inches if possible; he should govern himself by the web in the lap, the length of the feed roll, the condition of the bearings on the feed roll, the weight of sliver required to retain production, and the scope in the gearing. More cleaning and more polishing means stronger and more lustrous yarn and cloth. Isn't it worth investigation? Doesn't the lengthened draft mean more dirt beneath the mote knives? Does it not mean that the flakes have been eliminated and because of that isn't the dirt taken out by the mote knives just that much more?

I have yet to find a licker-in operating under these conditions that has been stuck, as we often see them where short draft is in operation. The slow feed eliminates that entirely. The wire stays sharp a greater length of time because the dirt is being removed where it should be, under the licker-in.

Now that the pickers and card are taking their own quantities of dirt and foreign matter from the tuft of cotton and that the instructions pertaining to the source of even running yarn has been attended to, we can go on in the discussion of the elimination of troubles feeling that the foundation of our construction is solid within itself. Before the experimenter attempts to change his conditions he must first sit down and consider every detail of the change for he must be entirely governed by his circumstances and not by another man's conditions, at the same time ever following these rules to success.

A. B. C. (R. I.)

The Feed Plate and Licker-in.

EDITOR COTTON:

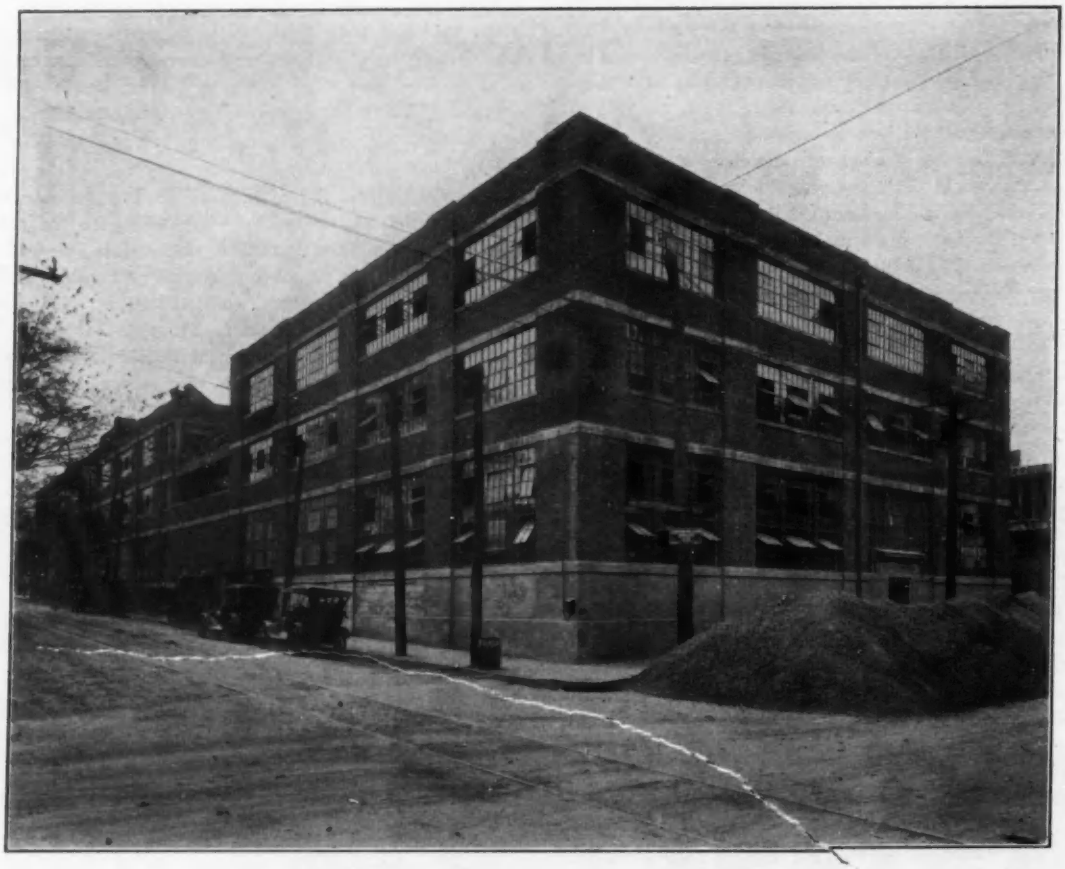
I would like to be allowed space in your columns to express myself upon the subject of carding, especially dealing with those points which are now being discussed.

I would also like to deal with that class of men who take great pride in mentally putting the word "practical" before their name, whenever appearing at the bottom of an article. And I hope that these men are not quite as set in their ways as some practical men I have known who perform a certain action or use a certain method simply because their fathers did it that way twenty years ago and got satisfaction; men who never inquire as to why they do it, and who occasionally get into a scrape as did one comber man I know who found that by setting wider he could increase his percentage of noils; one day, however, this rule worked in the opposite direction and instead of getting more he got less, nearly losing his job through it. This rule will only work to a certain extent, beyond which it will work the opposite way.

I will begin with the feed and take up a queer proposition as it has appeared to me about the setting of the feed plate. This is usually set according to the length of staple being run and the weight of the lap. It is customary to set this plate with every change of the stock, while some only change the setting when the change in staple is excessive. But I would like to ask those who chase their grinders to this setting, often leaving more important work, why is it that even when a radical change in stock of from, say, one inch cotton to one and a half inch, or a change of one-half inch, that the setting is only changed about 5/1000 of an inch, or not much more than the thickness of ordinary writing paper?

Do they imagine that this difference will save the fibers from being broken through a close setting, or too thick a lap? Even if there was a bite at both ends of the fiber this slight change would not release it.

I don't want the readers to think I would advise them to ignore this setting entirely, but I would like to offer this suggestion: Set no closer than a 10 gauge for stock under



FACTORIES AND WAREHOUSES

RE-INFORCED CONCRETE CONSTRUCTION

ARTHUR TUFTS COMPANY

CONTRACTORS AND ENGINEERS

ATLANTA, GA. BALTIMORE, MD.

an inch and a quarter; for anything over this, set at a 22 gauge; and use these two settings only.

I know that I will doubtless be criticized by some mill men for this opinion, but I should like to have such critics present their side of the argument in these columns.

The next function which treats the cotton is the licker-in, whose diameter, speed and points per inch passing through the lap govern the amount of work it does. It is this working capacity that I wish to bring out so that we may determine, as nearly as possible, whether it really accomplishes the work claimed for it by many mill men.

Before giving actual figures of points per inch and fibers, I would say that the licker-in makes a certain amount of waste, not only in that it knocks some of the short fibers and impurities out which are not held by the feed roll, but it also wastes much good stock. If this feed roll is allowed to get a lap on it, as is sometimes the case, it will raise that part of the feed roll up, causing it to lose its grip on the rest of the lap, not cleaning the lap at all, but plucking it out in bunches, many of which are thrown down into the screen as waste.

It is absolutely necessary that in order to properly treat a fiber, one end must be held, exactly as when one combs one's hair, the hairs that are not held by the scalp will be pulled out by the comb. Even under the best of conditions, it is safe to say that the licker-in does not retain its grip on all of the long fibers, as some of them free themselves after they have left the lap and before they get to the back of the licker-in screen.

At this point it might be well to state that a good many of the fibers which leave the lap are not pulled off by the licker-in, but by their cohesion with their neighbors, and will fly off at the first opportunity, which comes before they reach the first mote knife, thus increasing the percentage of screen waste.

The licker-in is the source of much discussion, on the subject of "light" and "heavy" carding, or the feeding of a "fast, light lap" or a "slow, heavy lap." Some men are as strong for one method as others are for the other method. Carders are wrangling over the question of which gives the better work, with no more conclusive proof than we had 20 years ago. Some mills are using one method while across the road they are, maybe, using the other method. There cannot be two best ways; either one, or the other is causing a great deal of trouble and bad work. And I will endeavor to explain this evil in my own way of reasoning.

The licker-in has a certain working capacity, the highest point of which is of course hard to determine; but if we over-work this capacity we will bring fibers forward which have not been treated, also increasing the possibility of their flying away.

In running a fast light lap, it is claimed that this will give the licker-in a better chance to act on the sheet of cotton because of the fact that it is lighter. But it is also faster, so what we gain in one way we lose in another.

I hope it is understood that I have no more use for one method than for the other. I'm sure there is a better way to determine whether or not the licker-in will do certain work. I would like to ask the advocates of the "slow, heavy" method one question, "What happens when a card lap splits and goes in double?"

Anyone who is onto his job will know that the licker-in will get choked up so bad with the overload that the belt will slip on the pulley and the licker-in will not move an inch. So it is plain that the weight of the lap, even if it does not completely stop it, will slow down the licker-in to a certain degree, reducing the surface speed and consequently reducing the number of points per inch passing through the fringe of cotton, which is the only cleaning property the licker-in has.

It strikes me as being rather strange that we don't hear much about "light" and "heavy" picking and combing; and yet the same conditions prevail—the beater of the picker and the half-lap of the comber have the same general duty, and no one seems to dispute the fact that if we feed a greater number of fibers, we reduce its working efficiency. For instance, if there is one fiber for every three teeth, and we increase the fibers to two to every three teeth, we cut down the efficiency of the operation one-third, and tend to injure the quality in the same proportion. In other words, it is this relation of the number of fibers to the number of teeth which governs the quality of work. This relation can be found by dividing the number of licker-in points passing the plate per minute by the number of fibers fed per minute.

For example, what will be the number of points of licker-in teeth per fiber, if the feed roll delivers seven inches per minute, feeding 2,900,000 fibers per inch, and the licker-in has 35,840 teeth and makes 440 revolutions per minute?

$$\frac{35{,}840 \times 440}{7 \times 2{,}900{,}000} = .8 \text{ or nearly one tooth per fiber.}$$

L. C. (R. I.)

Figuring the Yarn Number.

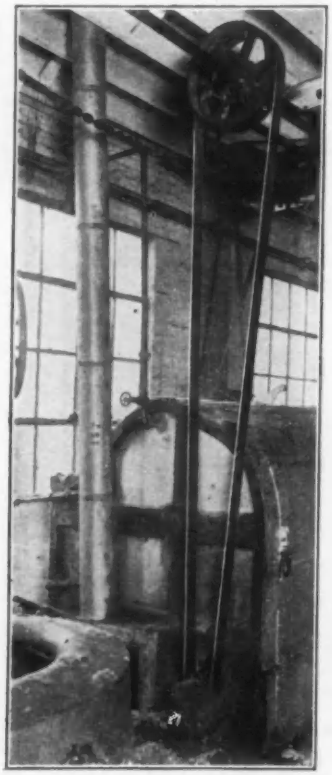
EDITOR COTTON:

It very often happens that a mill in getting a manufacturing order will be furnished with only a small piece of cloth as a sample of what is wanted. From this it is necessary to determine among other things, the number of the yarn, and as it is not possible to secure a sufficient quantity to reel off the customary 120 yards, a difficulty presents itself which can be solved in various ways.

There are a number of contrivances on the market for accomplishing this purpose, gengrally by cutting the cloth or yarn to a definite size by means of a template and then either making calculations or having them already made by some form of calculating scale. To one who has none of these devices the matter will appear simple by using the following line of reasoning:

The standard of length in calculating the number of cotton yarn is 840 yards, which for a number one yarn should weigh one pound. Now if that length is not obtainable it is only necessary to use a shorter length for a standard and at the same time to decrease the standard weight and then figure the necessary length of yarn for that weight. As one grain is 1/7000 of a pound the proper length of yarn for that weight would be 1/7000 of 840 yards which figures out 4.32 inches. This is the regular pound-hank calculation reduced to miniature. If an ordinary pair of delicate balances, such as is to be found in every mill, is weighted on one side with a one grain weight, then it will require 4.32 inches of number one yarn to balance it, twice that of number two yarn, three times that of number three yarn, etc., so that if the sample yarn

Another Unusual Belt Condition.



Here is a 3" RUSCO Solid Woven Belt running a washing machine from a 12" to 3" pulley at high speed.

The room is filled with moisture and the air with cotton and wool dust which clings to the surface of the belt. Yet it delivers full power and does not slip.

RUSCO SOLID WOVEN BELTING

The special RUSCO weave insures long wear and great tensile strength. The RUSCO impregnating makes this belting impervious to oil, dust, acid fumes, etc.

If the conditions in your plant are unfavorable and wearing to the belts you are now using, it will pay you to get in touch with our Service Department.

RUSCO is a dependable belting. It has replaced many costly belts in many plants.

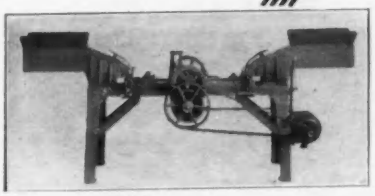
The Russell Mfg. Co.

526 Russell Ave.,

Middletown, Conn.

Branch Offices

New York, 349 Broadway. Chicago, 1438 Michigan Ave.
Atlanta, 60 S. Forsyth St. Detroit, 162 Jefferson Ave., E.



IT CAN BE DONE

The fellow who says it can't be done is usually interrupted by someone doing it. **It can be done.**

The reason some men accomplish more than others is because they approach the difficult task differently. They begin by saying, **"It can be done."**

Three golf players started a drive across a water hazard. Two of the fellows dug out old balls so if they failed to clear the water they would not lose a valuable ball. They had their thoughts on losing, and lost. The other player picked his very best ball and fixed his eye away beyond the water and thought only of winning, and won. He staked his very best on—**It can be done.**

Hazards are manufactured in golf to make the game more difficult, hence more interesting. Business would lose all its joy if the difficult hazards were removed. The real business man goes at it in the spirit of—**It can be done.**

Every business man today has his problems. They are vastly different from those of yesterday. He can and will win only as he approaches them in the spirit of—**It can be done.**—(Harry Newman Tolles, in the Business Philosopher for June.)

There's plenty of business to be had today. The only requirement is

GO AFTER IT

That's why 250 Textile Mills in the United States and Canada have installed "UTSMAN" Quill Cleaning Machines.

HAVE YOU ONE?

The Terrell Machine Co., Inc., Charlotte, N. C.

is cut in lengths of 4.32 inches and placed on the balance a piece at a time until it balances the grain weight, the number of pieces necessary will determine the number of the yarn.

As it is hardly possible to measure 4.32 inches with an ordinary rule, and as this is very close to 4⅜ inches, the latter may be used with fairly accurate results.

J. K. (Ala.)

Enzymes.

EDITOR COTTON:

I have been told that enzymes act powerfully as assistants to the bleaching of cotton goods. Will you please advise me through your "How Other Men Manage" Department how an enzyme is used, what it is, and what it accomplishes as an agent in bleaching? Please give full particulars. C. G. (Miss.)

EDITOR COTTON:

Replying to "C. G.'s" inquiries, will say that an enzyme (the word means levened) is an unorganized ferment, or group of substances, in the constitution of plants and animals, which decompose certain carbon compounds occurring in association with them. There is also another type of fermentation brought about by living organisms which is an organized ferment in the order of a mould. Commercially, the former is represented by the substance known as diastafor and the latter by the substance known as polyzime; either can be used though it is claimed that the liquifying power of polyzime is greater than that of diastafor.

The action of an enzyme in nearly every case is one of hydrolysis (hydration) the body acted on being made to take up water and to undergo a subsequent decomposition. Enzymes bring about chemical action by acting as catalytic agents; that is to say, they greatly increase the velocity of the particular reaction in question without themselves undergoing any permanent change. In the cotton trade they are known as biochemical catalysts which help to bring about a decomposition of the starches, gums, pectins and proteins found in unbleached cotton goods into substances which are readily soluble in water.

In bleaching, the impurities of the cotton fiber may be classified, for practicable purposes, as follows: Water soluble, alcohol soluble, mineral, ether soluble and nitrogenous coloring matters. Now, I think it may be said that a bleach is good when the nitrogenous and ether soluble substances have been removed from the fiber as it is only these substances which, when insufficiently removed from the cloth previously to the chemicking, cause a yellowing of the bleached cloth during subsequent storage.

These substances being of an organic nature are rendered soluble by the action of enzymes of animal or vegetable origin (polyzime or diastafor) and the action of the biological agencies upon cotton cloth results in an efficient and cheap method of bleaching fabrics.

In unbleached goods which were steeped over night in water at 120 degrees F. at a neutral or slightly acid reaction, it is found that the nitrogenous substances of the fibers were so broken down that they were completely removed from the cloth by washing in cold water.

The ether soluble substances of the cloth were more efficiently removed than would have been the case in the ordinary process of boiling and bleaching.

The alcohol soluble substances (which do not count) were very little attacked.

The starch on the cloth was transformed into dextrin which washed out in cold water; all of which goes to show that enzymes are a valuable adjunct to cotton piece bleaching.

If no diastafor or polyzime is used, a steeping in warm water overnight accomplishes something in the same direction as it sets up a ferment in the warm cloth which tends to hydrolize the starches and nitrogenous matters, but even in this case it is an enzyme that does the business.

In the sizing of warps and in the starching and finishing of cotton piece goods a thin boiling starch may be made which is adhesive and possesses greater penetration and a softer feel than crude starch by first boiling the starch in the usual way, then cooling it down to 120 degrees F., then adding two to three per cent of enzymes (diastafor), which must first be dissolved in a little warm water, then stirring well until the starch is liquid (thin), then add a little soda, or, boil up the mixture, to stop the action of the enzyme.

I would say here that either adding an alkali or heating the mixture above 150 degrees F. will kill the enzyme and stop its liquifying action. If, on the other hand, the action be not stopped, the enzyme will "carry on" and convert the whole of the starch into sugar and practically render the size unfit for use. Polyzime, we are told, will not carry the action so far, but will stop when the starch is dextrinized which, if true, would make polyzime the best for sizing purposes anyhow, and if its liquifying power be greater than diastafor, as claimed, it would be better for all purposes except the actual saccrifying or conversion of the starch into sugar.

Enzymes are used in the stripping and degumming of starched goods as the starch becomes solubleized and can be washed out. They are the proper thing to use in preparing cotton piece goods for mercerizing. They may also be used to great advantage in the bleaching of knitted goods and canton flannels or any class of goods that are wanted finished soft and elastic. Most of these goods can be steeped over night in diastafor, boiled for six hours in soda, soured, washed, chemicked, soured and washed up, etc., soaped if necessary. The steeped goods will be a very decided improvement on any that are unsteeped even if boiled more.

An enzyme is a good thing in capable hands.

W. B. (Maine)

An announcement has recently been made covering a decision rendered by Federal Judge Hazel in the United States district court of the western district of New York in the case of the Permutit Company against the Harvey Laundry Company and the Refinite Company. This decree, which calls for an injunction and an accounting in favor of the plaintiff, has been issued in booklet form for any persons interested in this particular litigation and copies may be secured upon addressing the Permutit Company, 440 Fourth Ave, New York.

K-G

Spinning, Twister, Spooler

TAPE

is made of the best material by expert workmen.

Is the finest woven.

Has the smoothest edges.

Has all the qualities necessary for long life.

An honest product.

You have only to use to be convinced of its superiority.

Samples on request.

Manufactured by

Knit Goods Specialty Co.

26 Paine Ave.,
Chicopee Falls, Mass.

BOSTON HANK CLOCKS

The Recognized Standard for Accuracy and Durability

Many thousands in use.

Lasts many years.

All parts interchangeable.

Prompt delivery.

Special clocks to order.

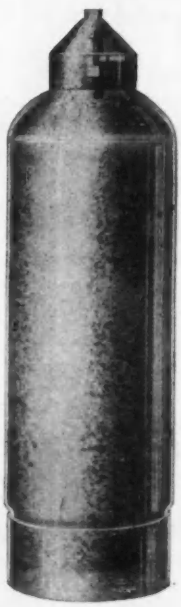
Write us your requirements.

Our experience is at your command.

Boston Clocks tell just what the production from each frame actually is

BOSTON MACHINE WORKS CO.
LYNN, MASS. U.S.A.

Offices at
Cincinnati, Ohio. Milwaukee, Wis. St. Louis, Mo.



COTTON MILLS SHOULD USE

Commercial Acetylene For Welding

Supplied in portable cylinders on loan basis without deposit.

Only the purest gas can safely be trusted to meet the exacting demands for cotton mill welding repairs. Commercial Acetylene is a gas of absolute purity.

WRITE FOR OUR SERVICE AGREEMENT

Commercial Acetylene Supply Co.

204 Trust Company of Georgia Bldg., Atlanta, Ga.
Main Office: 80 Broadway, New York City
203 S. LaSalle St., Chicago

Aurora, Ill. East Deerfield, Mass. Boston, Mass. Toronto, Ont. Moberly, Mo. Round Brook, N. J. San Francisco, Cal. Berkeley, Cal.

Winding on the Fly Frame.

EDITOR COTTON:

Unlike almost every other machine through which the cotton passes during its process of manufacture, the cone winder cannot be said to have any effect on the condition of the yarn passing through it, (except when equipped with yarn cleaners), since its only object is to assemble a greater length of yarn and put it in a suitable shape to be unwound at the next process.

Winding is quite an expensive item. The rate paid for winding is from $1.20 to $1.80 per hundred pounds. Assuming that we pay $1.50 per hundred pounds, if a mill turns off 20,000 pounds the cost for winding would be $300.

My object in writing this letter is to point out to the mill men making soft twisted yarn how a fly frame could easily be converted so as to make the winding process obsolete in the hosiery trade. This would be an enormous saving, especially in mills running waste.

Waste mills, as a rule, have the following hang-up: Opener, breaker, finisher picker, cards, two processes of drawing, slubber, intermediate, and ring spinning. Waste yarns spun on any ring frame have a very bad appearance being uneven and full of thick and thin places. The turns per inch for hosiery yarn vary, as a rule, from 9 to 12 turns to the inch. Any fly frame could insert this number of turns to the inch, simply by increasing the sweep of the arm carrying carrier gear between the twist gear and top cone gear.

The jack roving frame will make a much better strand for knitting, for numbers from one to tens, and no doubt would be adopted, but the method of winding-on is the chief objection.

On all fly frames, the roving is traversed from top to bottom of the bobbin, the traverse of each succeeding layer being slightly shorter than the one just preceding it. In order to build a bobbin of roving that will unwind without breaking when placed on the knitting machine, the roving must be placed in coils on the bobbin. Each succeeding coil being slightly higher on the bobbin, the same as the filling wind on the ring frame.

If a 6 x 3 inch jack frame is used, the base of the bobbin should be three inches in diameter tapering down to about one inch, the same as any filling wind bobbin. But how can a filling wind be accomplished on a fly frame? How bobbins are wound is often puzzling to even practical men, but it is simplicity itself. So many inches are delivered by the front roller per minute, and just the same number of inches must be wound upon a bobbin in the same time. Now, let us assume that the spindle and flyer are standing still, and also that the roving will draw through the flyer without twist and without breaking. Thus it will be seen that the surface speed of the bobbin must equal the surface speed of the front roller, which is constant. This continues for one layer upon the bobbin, at the end of which time the revolutions of the bobbins are reduced in the right proportion to keep the surface speed the same as before, and so on until a full bobbin is formed. At the end of each layer an adjustment of the revolutions of the bobbin takes place and this is done by automatically and positively moving the cone belt to a new position. The amount of movement is the same all through the building of the bobbin for a certain hank.

As each layer is being put upon the bobbin, the cone belt is working upon certain diameters of the cones (known as intermediate speeds) to produce the right revolutions to keep the surface speed always the same.

In order to obtain a filling wind bobbin, all the intermediate speeds must be traversed by the cone belt, or, in other words, the cone belt must be made to travel from one end of the cones to the other for each upward and downward movement of the carriage. This could be easily accomplished by a worm and dog similar to that employed on the traverse grinding wheel for grinding cards.

The dog would shift the cone belt by being attached to the shipper. The worm would be driven from the twist gear, and any change in the hank roving would change the intermediate speeds correspondingly to the change made in the twist per inch, thus holding the relationship of the surface speed of front roll and bobbin equal. For the traverse we would use the American builder.

The jaws of the builder would be set to equal the length of the traverse and made fast together. The tumbler shaft would be extended, the top of which would have teeth similar to that of the rack, and by means of a rack gear the tumbler shaft would be made to rise slightly higher at the end of the downward traverse. It would be necessary to have a key on the lower end of the tumbler shaft equal in length to that of the traverse, and loosely fitted so as to easily slide through the cam at the bottom of the tumbler shaft without binding.

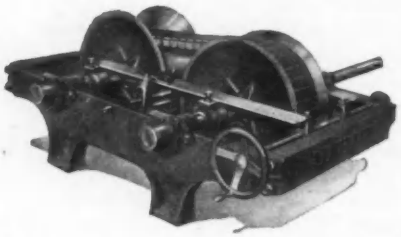
The operation would be as follows: The speed of the worm would be constant, when the traverse would be at the shoulder of the bobbin the cone belt would be on the large end of the bottom cone, and when the traverse was at the chase the cone belt would be at the small end of the bottom cone. Thus it will be clearly seen that all the intermediates are employed at every traverse from shoulder to shoulder on the bobbin, and that these parts acting as governors have a constant speed.

By having the jaws of the builder arranged to equal the traverse from the shoulder to the chase of the bobbin, the desired traverse is accomplished, and by having the tumbler shaft serve as a rack and made to rise slightly at the completion of the traverse chase, the carriage will rise as the bobbin builds and the filling wind obtain. At doffing time the tumbler shaft would be wound down instead of winding the rack on the fly frame.

The foregoing is possible, and can be easily accomplished by any expert on fly frames. It would not only mean a great saving, but would turn off a larger production of a better quality, which would lower the cost still more.

Wash (Conn.)

The majority of human beings are prone to suffer more from the things that never happen than they do from the things that really do happen. Just when or where the Fear-Bug was injected into the human mechanism, I'm not saying. Perhaps it can be traced back to Adam. It matters not, it is there and it will take years of optimistic treatment to eliminate it.—*The American Oulook.*



COSTS

What you are most interested in NOW is REDUCING COSTS.

We believe that we can PROVE to you that you can effect extraordinary savings by using

LEWELLEN
Variable Speed TRANSMISSIONS

We will be more than glad to explain, first why you should vary the speed of your machines to accommodate different materials in order to reduce waste and increase production; and, second, why "Lewellen Transmissions" offer the best means of controlling that speed on any textile machine, large or small. We will gladly discuss the matter without obligation on your part.

Send for information.

Lewellen Manufacturing Co.
Columbus, Indiana.

Paint Economy

lies in the application of a paint that will last for many years without repainting and not in using the "lowest price per gallon" paint.

Dixon's Silica-Graphite Paint

because of its unusual pigment, flake silica-graphite is able to withstand wear for the longest period.

It will not peel, crack or flake off because of the natural elasticity of this pigment.

As one user has stated, the saving secured through the use of Dixon's Paint made the paint and labor cost absolutely nothing when compared with the paintings that would have been required had an inferior paint been used.

Write for long service records and Booklet No. 34-B.

Joseph Dixon Crucible Company
Jersey City, N. J.
Est. 1827.

SHAMBOW

FIBRE CLAD SHUTTLES

FAVOR PRODUCTION

Shambow Shuttle Company
Woonsocket, Rhode Island.
The Walraven Company
36-38 West Alabama St.,
Atlanta, Ga.

GARLAND

This Trademark
Is a Guarantee of

G TRADE MARK

WEAVING AND
WEARING QUALITY

We want every user of our loom harnesses to know how well they weave and how long they wear and for this purpose stamp our trade-mark on the white twine of each harness and label the shaft of each harness with the month in which it is made.

GARLAND MFG. CO.
SACO, MAINE

Outside Advantages for the Mill Village.

EDITOR COTTON:

The corporation which succeeds is the one which has the most conveniences worth while surrounding the plant. Good help gravitates naturally to the most desirable mill towns, and are more likely to remain contented where the best conveniences predominate. Work and comfort are always the best of friends and are both considered very desirable institutions, and where these two are united, workers are apt to appreciate their lot the more and to give the good service expected of them.

For example, the mill village which has a laundry is much more attractive than a village without a laundry. For years many isolated mill villages which did not have the conveniences of a laundry, found that the incoming of a laundry produced other results besides washing clothes clean. Where the laundry was not planted, there were "blue Mondays," not only for the majority of the married women but also for some men, and for the mills, because so many women stayed out on Monday to do the family washing. If they did not stay away from work Monday they either did their washings on Sunday or Monday nights and then dragged themselves through the mill work on Mondays or Tuesdays on account of having so much of that "tired feeling". Some mills were persuaded to install a laundry in the village, equip it up-to-date in every way, and operate it under their own management. Where this was done and the work done at cost or a very small profit, it was found that the increased efficiency of the women workers and many of the men who also helped to do the family washings, gave better satisfaction in the mill. They worked better and did more work, thus earning more money for themselves and for the mill without being burdened with the drudge of the family washings. A laundry around the mill village is as necessary as the mill village.

Among other outside advantages which many corporations count as an asset, are the following: restaurants, reading rooms and club rooms for men, and for women, bath houses, moving picture shows, play grounds, hospitals, children's nurseries, dentists, doctors, provision stores, churches, and evening schools. The writer has in mind a very prosperous cotton mill, which, with its village, is located only one mile distant from quite a large and attractive city, and yet this mill village is fully equipped with all of the foregoing attractions.

The corporation employs a doctor of medicine to care exclusively for the help. The help pay for the medicines at reduced rates, but not for the doctor's time and advice. A dentist is also employed on commission and all of the work is done at greatly reduced rates. There are also two rows of bath houses, one for the men, and one for the women, all fully equipped with hot and cold water, shower baths and tubs. The help furnish their own towels. All married couples having very small children, which it would not be safe to leave alone, are cared for by the day nursery which is divided into three sections: One for the care of infants, one for those who can be entertained at a kindergarten, and another as a gymnasium connected with a spacious play-ground where the older children can be taken care of before and after school. Here, the father and mother of a family, together with all of the workers in the family, can work full time without fear or having the care and anxiety of their small children. Their children are cared for by competent experts in each department, and thus receive systematic and better care than they would receive at home. In the cases of those infants which are nursed by their mothers, the mothers are allowed the time to go out of the mill and nurse their babies at the regular hours losing very little time, either for themselves or for the mill.

The two club rooms for men and women are elaborately fitted and provided with every convenience, and the latest and most interesting periodicals of the times are to be found on the tables.

A moving picture show is maintained by the corporation free of charge. In this amusement hall is also maintained a lecture course on various subjects for the elevation and education of the help and their relation to the efficiency of the plant. The moving pictures are of a high order and are shown only twice a week. There is also a fully equipped hospital for the sick. In connection with this institution there is a trained nurse employed to assist the physician in his work. Then there is the splendid restaurant providing all kinds of palatable and substantial foods and dainty dishes, all to be had at the lowest possible prices. Profit is not considered. The idea is to have the help well taken care of.

This corporation also maintains a large grocery and provision store where the help can buy goods at reduced prices over general market retail prices. This is done by the sale of checks at the mill office where the money is exchanged for 10 per cent more in value than the purchased amount. These are good as local currency at the store. And there are the various sport teams for ball players, swimming, foot ball, etc. There are picnic days and sporting events which rival expert and professional training.

This corporation even has a farm of several hundred acres upon which is raised milk and table vegetables which are sold at cost to the help. This mill also has a wood lot of several hundred acres from which wood is cut, sawed, and split, and sold to the help at a small profit. This company also owns and operates its own meat refrigerating plant from which is supplied the best of fresh meats.

Lastly, this mill village is blessed with an ideal evening school of two branches. One is for the securing of a common education. The other is a textile school where young men can train themselves for advancement at their trade. Both are free of charge and conducted under expert teachers. There is also a people's church. A minister and his wife are employed to look after the spiritual uplift of the help.

Although this mill is only a mile or so from the city, it is a fact that the help of this mill village are so contented at home, that they rarely enter the city for any of its supposed larger comforts. This mill has the pick of the leading help from many other textile states in the United States. This is all because the owner of this mill is noted for his philanthropic spirit, and his manufacturing officials are among the most competent and efficient of their kind, and, like their great leader, they treat the help courteously and take a kindly interest in all of their human affairs outside of the mill as well as in their work in the mill.

A word about the housing of the help for this mill is to say that there is no more attractive mill village any-

BLEACHERS!

The trade is getting impatient of cottons that have been weakened; that yellow-up on the shelves; that are harsh and inelastic.

There is in fact a strong demand for a better bleach.

We teach peroxide bleaching that overcomes all these things; costs no more and calls for no new apparatus.

Peroxide Advice Free to Mills.

THE ROESSLER & HASSLACHER CHEMICAL CO.
41st St. and Sixth Ave.
NEW YORK

where. The houses are kept in fine repair, hardly two houses alike, nor painted alike. The village is clean and orderly and provided with artesian well water, sewerage, and electric lights. The help are so happy and contented that there is a large waiting list to get in with this corporation. But before any new help are taken in, they are carefully looked up, and they cannot join this ideal plant without having credentials of the highest order and must be properly vouched for.

This mill pays a bonus to *full time* workers.

The company employs their own police officer who is properly sworn in by the city ordinance. This officer is not employed so much to keep the help in this splendid mill town in order, as he is more to prevent disorderly outside persons from entering to make disturbances. Needless to say this mill has prospered as it should and is reaping a just reward. The owner is idolized by his help but he does not know it. It is a model mill town in which the owner and the help are very happy and take great pride in each other. The owner of this plant is a marvel of generosity—is a genius himself. His little city has a model fire department. He has also done considerable good by way of loaning money to his help, sometimes at a loss to himself, as in cases where sickness is involved, and the money cannot be returned, he has often cancelled the charge. He never brags about his work. By those who know him intimately, he is considered a wonderful business man.

D. H. (R. I.)

Swift kindnesses are best; a long delay in kindness takes the kindness all away.

Card Strips and the Stripper Plate.

EDITOR COTTON:

It is interesting indeed to note the inquiry coming from France regarding what effect certain settings of the stripping plate has on the card strips. Also the one on the roving frames as to the twist in the roving. It shows we have an American textile journal in COTTON that is regarded as an authority, and one that the contributors to COTTON must stand by and support so as to keep it to the front where it truly belongs.

The only conclusion that I could ever arrive at from a practical standpoint as to the cause of setting the front knife or stripping plate close to the cylinder to get less strippings than when it was set farther away, is that of the circulation of air or draft in the card. The effect that it has on the draft is evident, for you can take the back knife plate over the licker-in and adjust it farther away from the cylinder and you will cause more fly to fly out over the licker-in. The same is true regarding the cylinder screens, which goes to show that the plates and screens must be set in such a way that the draft will circulate around the cylinder and must not be interrupted but allowed to circle round and around.

It looks as if this should work the other way, as when you draw down on the plate you take the plate farther away from the flats, and between the flats and this plate is where the strips come out, therefore, giving more space for the strips to come out would look as though more strips would come out, but this does not happen. The cylinder holding its circulation of air draws in the cotton

fibers by this current of air and sucks them down to the cylinder and the cylinder retains them, taking them away from the flats. It's like holding a small fluff of cotton close to a suction pipe and noticing how the fibers will lean to the draft.

Only today I was talking to a man who erected cards for 15 years, and as we read these questions, the only conclusion that either of us could arrive at was the effect the draft of air had on the cotton. Two years ago I had the same question up with another erecting man, who, by the way, had been an erecting man for a number of years, and in substance he said it's the draft of air and the way it circulates that has a drawing tendency to suck the cotton down around the cylinder.

In regard to the twist proposition on the roving frames, as to which has the more twist, the front line of spindles or the back line, I will say the back line seems to always have more twist as it feels harder and has a shorter space between the front roll and the bobbin and will take up quicker. The front line, or the line most distant from the roller, has a longer pull and seems to be softer. As I see it, it's like this: suppose that the distance was twice as far to the front line bobbin, does it not look reasonable that the bobbin would be that much softer, and longer about taking up its twist, even though all are running at the same rate of speed and taking up the same amount of roving at the same time? The front roll is delivering the same amount all the time and it only appears to be the length from the delivery to the take-up that makes the difference, if there is any, and there does appear to be something that makes the roving feel different. Contributor No. 14.

Doffers and Section Hands.

EDITOR COTTON:

It was with the greatest pleasure that I perused the remarks of "Contributor No. 14" in the January number under the heading, "Another Mill Experience." This letter in part was pleasing to me for the reason that the writer thereof believes in some of the statements which I have made. But, in my judgment, he made a mess of it in the last paragraph.

First, he says it seems that I had a few too many doffers. He does not state the production of his fly frames, but in the January issue, on page 219, the reader can see the number of pounds that I turned off, which is a record of which I am proud; a record that was possible only by having nine doffers.

Next, he would have a section hand to drive the doffers. This, he states, "keeps things lively—when you have to keep hustling." But I wonder what Contributor No. 14 is doing while his hustler is on the job? What are the duties of a section hand, anyway?

I have a different style of running a card room. I hire more doffers and have no section hand. A second hand is enough, no matter how large the department, that is, if he knows his business. I am around the room every minute, and read my newspaper at home.

I have a hank board that serves as an incentive to the fly frame tenders. They all have a certain amount of pride, and dislike to be credited with the least amount of hanks turned off. Besides, I have a column next to the hanks which shows the number of single and double roving. You know, speeder tenders can turn off a great amount of work by letting everything go.

As regards the doffers, they are a great deal like the advertising writer—if the production falls off, they are soon out of a job. I would a thousand times rather be fired than dogged.

Further, I never heard of a jack frame $7 \times 3\frac{1}{2}$ inch gauge.

Next, let us consider the number of operations necessary in doffing a roving frame. The flyers are cleaned, the front row of flyers are removed from the spindles, two doffers on each end of the box doff the full bobbins. Then the ends are lapped around the back row of bobbins, the front flyers are replaced on the spindles, and the ends are lapped around the front row of bobbins.

Suppose at that time the frames doffed twice each day, $34 \times 2 = 68$ sets per day, and, mind you, with only five doffers! Where does their time come in to sweep, clean the backs and also keep the bins and roving boxes in order?

It's the same old story, frames stopped waiting for the doffers, and then the one responsible for such conditions is puzzled when others get what should be gotten out of a fly frame. Wash (Conn.)

Supplies—Their Use and Abuse.

EDITOR COTTON:

When the foremen's meeting came together for the evening discussion, there was posted on the board the following questions:

"Have you any standard to follow in the use of supplies?"

"How do you decide whether any new article of supply furnished is better than the one you have previously used?"

The men moved around the posted notice and talked in a low voice among themselves until the manager rapped for order. "You probably do not quite catch the meaning of the questions that you have so earnestly examined," he said. "I think that you have all followed the rule that whatever was furnished by the supply room, was something that you had to use. You never thought that we, all of us, are under the necessity of finding out the value of the things that are offered to improve conditions that we find unsatisfactory by experience."

There was a slight pause and John stood up, "Fellows, that is something that has puzzled me, ever since the matter of keeping the room clean was raised by the insurance inspectors," he began. "You know that on account of the low cellar that we have under the weave room, and the fact that all the belts come through the floor, that we are supposed to keep the shaft and floor free from lint, and waste. The other day, when our chairman was at the other mill, one of these inspectors came into my room declaring, 'I shall have to make a complaint on my report today about the condition of the cellar. There is so much dirt and waste in it that it is a bad fire risk, that will have to be noted.' Of course, I said all right, but it set me thinking all the same.

"You know that for some time we have been using floor brushes and brooms for keeping the floor clean, and that among the looms it is sometimes hard to make the place look as if it was swept regularly. Now it occurred to me that if this old cellar was to secure such a very careful inspection every three months, that I might have trouble among the looms. You cannot really blame a weaver for brushing

The CHICAGO
Approved Portable
WATCHMAN'S CLOCK

Clock with case opened showing Dial in Place and Partial Registration.

with its special Waltham movement, its lock stations and its superior quality throughout, is especially desirable for mills and factories and for either in-door or out-door patrol.

Write for Catalogue.

CHICAGO WATCHMAN'S CLOCK WORKS
CHICAGO 1526 S. Wabash Ave. NEW YORK 11 Church St. ATLANTA Grinnell Co., Inc.

Handling Mill Supplies

Photo by permission
Tupelo Cotton Mills, Tupelo, Mississippi

When your stockroomis crowded for space
When you want greater accuracy in handling Supplies
When you need adjustability for varying stocks
When you require equipment as fireproof as the most modern building construction

Investigate Steel. No obligation of course.

Lyon Metallic Manufacturing Company, Aurora, Ill.

Acme DOORLESS Baler

Will Reduce Your Shipping Costs

You can get many more bales into a car when the baling has been done with

ACME BALERS

Therefore you will need fewer cars.
These powerful machines produce an extremely compact bale. You can get 50,000 lbs. into the ordinary freight car. This means also that the bales require less storage space. The Acme is the baler without doors. Four Acme Balers fit into the same floor space required by a single baler with swinging doors.

Galland-Henning Mfg. Co.
Milwaukee, Wis.
Southern Sales Representatives
THE LOVINGOOD COMPANY, Atlanta, Ga.

FORTY-FIVE YEARS MANUFACTURING HIGHEST GRADE CLEANING POWDERS
INDIA ALKALI WORKS BOSTON

For Clean Cleaning of Mill Floors

SAVOGRAN

Is INDISPENSABLE
Likewise ECONOMICAL

A Trial Order will Convince

INDIA ALKALI WORKS BOSTON, MASS.

some of his dirt through the belt holes into the cellar. But I figured that if this was to come up every time that it was inspected, I was in for trouble.

"A little later I was called into the card room to see Will about a main belt, and went along among the revolving flat cards just as they were stripped. When I saw the fan draw all the loose lint from the stripping, and deposit it in a suitable place without dust, I questioned whether that was not the way to clean the weaving room floor and the cellar. The more you move dirt from sweeping the harder it is to clean it up again."

"That is just what I wanted to bring out with the posted questions," said the manager. "Do not we too often follow a custom and use the broom, the floor brush, the belt, the pail or anything that we get from the supply room without thinking whether the article furnished us is what would be the best for the place where we have to use it. We, sometimes, make the case of getting something to fill a place the only thing we look for, and do not investigate if another article would not save both time and labor."

Jim then arose and said, "That explains why we were so long in finding where all the bobbins from the frame spinning were lost. It was always the custom, you know, to bring the filling as soon as ready to the number four weaving, and the weavers could hardly wait for the load to be put on the floor, when it was all carried away. It seemed as if we were losing no time to keep the loom stands full. One day George came over the bridge, and standing in front of my desk said, 'Jim where are my spare filling bobbins? I shall have to wait for bobbins at three o'clock.' I looked at him in surprise. 'What are you figuring on,' I asked, 'we have only enough to fill the weavers' stands.' 'That cannot be' he reiterated, 'for I just had four thousand extra come from the bobbin makers, and there is no extra stock on hand filled, and yet I shall be short the next doff.' He had me, and we went around among the looms to see if there was any extra stock, but there seemed none in sight. Then we journeyed down into the cellar where the extra full boxes were kept. We walked around the pile and counted the full ones, but it did not seem to agree with what either of us thought we had ahead. I moved the empty boxes away to one side, and found that there was only two or three boxes on top that were empty, the rest of the pile were full. That was not the worst, the numbers were all mixed up, 42s, 36s and 60s were in the same pile. I was mad clean through, and went and brought the filling carrier down to have him sort them over and explain.

"Now, what you suppose he said? 'Boss, for some days I have had no filling for the ell room and the weavers have been after me something fierce. So the first of the week, I arranged with the truckman to bring all the spare boxes that he could get hold of on top of the piles, and fill up underneath with full boxes. The weavers saw the truck with empty boxes, and he and I piled them down here, and I have had no trouble with the ell room since.'"

"You could have knocked me down with a feather, after all the talk I had given George that we had no spare stock on hand. We hurried around the room and picked up all the bobbins that were empty, and secured enough to start his frames when they were doffed. But we changed the way filling was delivered to the weavers after that. Is not that the way we have done with our supplies? We think that we are short and send a boy over to the office, and have him make a special trip with the order to get us brooms or belt, and then forget all about it."

After a general discussion the following rules were adopted:

1. Each foreman will take a full list of the supplies on hand of all kinds; such lists to include all those in use partly worn, or ready to be replaced.

2. These lists of supplies will be arranged to cover all the places in each room said supplies are used. Also will embrace the duties that said supplies fulfil.

3. Before ordering any new supplies to take the place of those on hand, the time that it takes to wear them out will be recorded and if any will be available to use longer in a less difficult service, such a change must be made.

4. Supplies that are used up, as far as the service in any special room is concerned are to be carried to the cellar of the supply room, and examined by the master mechanic and two of the selected foremen every week. Their report on these to be made at the next regular meeting of the foremen. Such report to cover all possible detail about the said supplies. Whether they can be further used in any other department, or whether they have been treated unduly hard in their use before being returned as worn out.

5. When any new supply is furnished from the supply room for any old use, or for some new service, it will be issued to, at least, three foremen, and as soon as they have made a test, their report be submitted for general discussion at a regular meeting.

It was also suggested that each foreman, if he felt that some change in the type of article used for service be valuable, that such change be brought up for discussion; that the proposed method or article be explained by the suggestor; and the reasons for its adoption be fully stated.

A. H. G. (Conn.)

"The Textile Manufacturer," a monthly journal published in Manchester, England, issued, in connection with its regular issue of June 15, a very handsome special World Cotton Conference supplement, covering the meetings of the Conference held during June in Liverpool and Manchester. This is a very complete supplement, containing 156 pages, and reproducing in full the papers prepared for and presented at the Conference, together with a running story of the proceedings. It makes an excellent reference volume for those desiring to have on record the proceedings of the Conference. The publishers are Emmott & Co., Ltd., 65 King St., Manchester.

Among the many ways in which cost keeping is an aid to production are the following: It brings to light inefficiencies in system by calling to attention the cost of its operation and points out equipment that has become inadequate by showing an excessive cost of product coming therefrom; it points out employees who are below the standand required, and permits of performances being kept within certain limits by watching the accumulation of costs. Increased production depends largely on the intimate knowledge the management has of all elements in their manufacturing operations which can only be supplied through an adequate cost system. It enables them to establish proper control and increase output as warranted by the cost record.

Characteristics of Cotton Required by the Spinner and Present Defects.

(*Continued from page* 760.)

the yarns from which the cloths are made, and spinners are called upon to meet debits accordingly.

I have placed evenness of grade in a secondary category as compared with evenness in length of staple and ripeness. There are some sections of the trade working to produce a standardized cloth or natural color fabric, or one that is intended to be finished in a particular color, where any variation from a given grade is fatal. That is why, on certain occasions, perfectly graded cotton with no special merit from a staple point of view, has commanded a very high premium. Speaking generally, however, the cotton trade has a great adaptability so far as color and grade is concerned.

If spinners and manufacturers knew that for some seasons ahead the bulk of cotton grown would be white, brown, or cream, they would make their dispositions accordingly. Samples would be produced, special cloths would be put upon the markets to touch the fancy of users, and the particular grades carrying premiums would be left to those whose business engagements and standards would not permit a change. When, however, color or grade changes without due notice, the spinner is faced with a crop of commercial troubles. A scramble ensues to secure the types upon which the season's trade has been built. Very heavy premiums have as a consequence to be paid, and an artificial market, which causes trouble both in its rise and fall, is created, and either the spinner whose trading has been perfectly straightforward and in accord with the canons of the trade, or his broker, or the cotton merchant, suffers accordingly. If, on the other hand, a spinner allows his grade or color to follow the trend of the cottons of the day, a course which very few dare adopt, the financial loss will probably be greater. He loses his character as a spinner of a known quality. His practical working arrangements may be perfect and his yarns as good from a strength point of view as the needs of the case warrant, but the finishing properties of the cloths or fabrics made from his yarns are entirely altered, and he may be called upon to meet claims on account of one or other of the many blemishes which expert cloth examiners are quick to find, and for which they are ever eager to place the responsibility upon the yarn spinner.

With regard to what may be described as impurities or artificial defects in the commercial cottons of the day, some of these are well illustrated in the mounted specimens on exhibition. These were collected and fixed by a friend of mine from deliveries made to him during the current season. When pieces of iron, whether bolts, bale iron, or sticks or stones or other hard substances pass undetected into the opening machines of a cotton mill, they inevitably cause damage, sometimes very heavy repair bills are incurred, and many fires, involving the mills in costly stoppages, result. Unquestionably, the responsibility for this defect rests upon the gin or compress owners. Constant vigilance is necessary on the part of the authorities who control these establishments, and, may be, penalties exacted from those who are negligent if this class of trouble is to be eliminated.

Broken seed, sometimes in the form of bearded motes and leaf, as features in commercial cotton must be debited as evidence of inefficiency on the part of the producing countries. I know that we shall be told that "Cotton pickers are human, and sometimes pick leaf and boll with the seed cotton. That when hundreds of pickers are employed it is difficult to exercise absolute control, that the gin is designed primarily to take lint from seed, but as at present designed cannot extract more than a small proportion of leaf and husk." Indeed, in the case of the bearded motes, the saw gin with its savage action is very largely responsible for their production. One easily recognizes the cause of the trouble. The remedy should not be difficult to find. In the meantime spinners are constantly experimenting and attempting to improve upon their present equipment for the minimizing of the results of these defects.

I understand there is and will always be a small percentage of sand in cotton. This is due to the carrying action of the winds and the holding power of the cotton. The explanation is a good and reasonable one, but it cannot apply where a heavy pocket of sand is found in the center of a bale. When this occurs it is plainly a case of fraud, and as such the person responsible should, if possible, be sought out and punished.

Excessive moisture in cotton is on the same plane as sand adulteration, and needs no argument to secure its condemnation.

Obviously the defects named are weighting agents. Freight and insurance are paid to get them to the mill, and when they arrive there the cotton is of a less total value than if the weighting agents were absent. To abstract the impurities costs money, and it appears to me that the money lost at the three points would serve a better purpose if divided as wages to the workpeople, profits to the millowners, and an extra price to the grower.

There is one other defect in the cottons of to-day which has developed to a marked extent during recent years. I refer to the presence of fibers of a flax or stringy character which appear from time to time intermingled with the cotton. It may be that country bags are being made of unsuitable material, or that sufficient care is not being exercised at the ginneries or compresses with regard to the character of the stores they use, and that sometimes portions of one or other of these materials get mixed with the cotton. It is no exaggeration to say that recently this class of adulteration has given managers of mills more concern than the more regular defects. It will be observed from the sample that a long length of the fiber could easily pass undetected when once mixed with a weight of cotton.

One strand in its passage through the cleaning machines is broken up into thousands of pieces, some of them not more than 1/16 in. in length. A large proportion of these small pieces cannot be extracted, even by the comber, and pass forward to the drafting machines. As they emerge from the delivery roller at the mule or ring frame the yarn breaks, and if a large number of bits are in evidence a bad spinning complaint, which the spinner cannot remedy, results. It is obvious that this defect can be eliminated at the source, and steps to secure this ought to be taken at once.

The dates for the annual meeting of the Southern Textile Association have been officially set as September 16 and 17, and the meeting will be held in Charlotte, N. C. A meeting of the carders division of the Association has been called to meet in Columbia, S. C., about the middle of August.

KNITTING SECTION

The Attention of Manufacturers Is Invited to Our New Model K

Producing a fabric without lines, using a latch needle, permitting speed of production, the making of heavy heels and toes and perfect plaiting.

Increased width of top and a greatly pronouncedloose course for looping are features of great value.

ESTABLISHED 1865

Scott & Williams

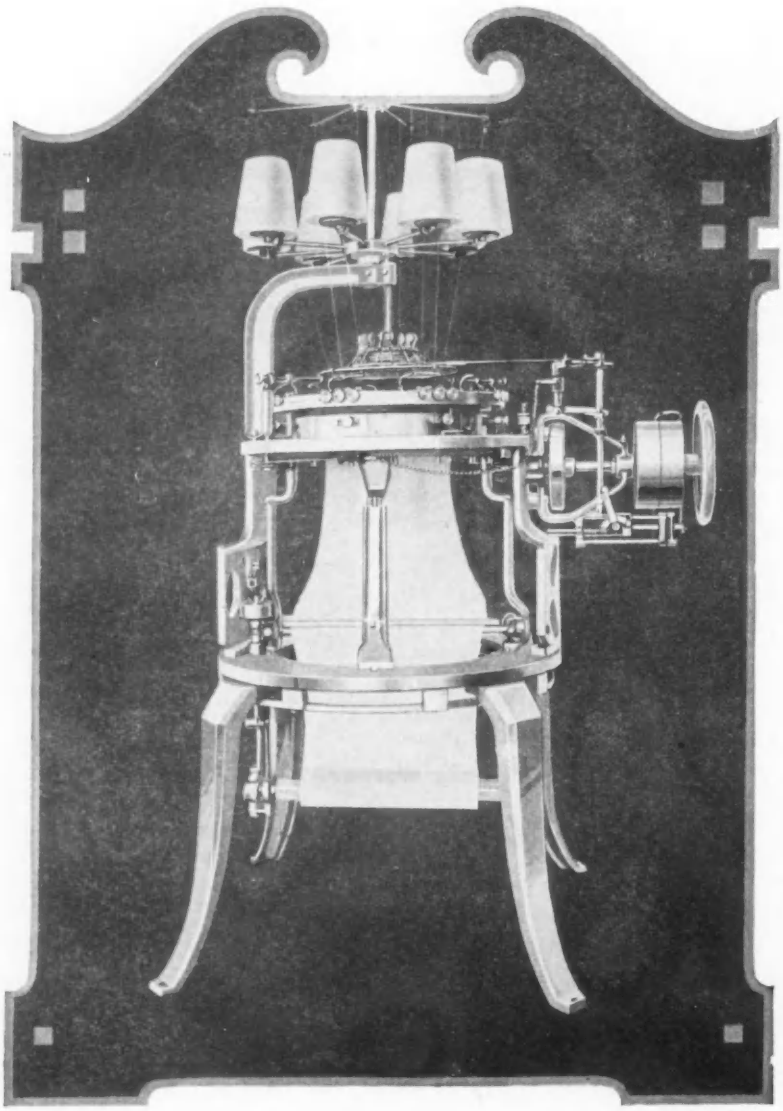
INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

Charlotte
1006 Realty Building

WILDMAN
THE WORLD'S STANDARD



Wildman Spring Needle Body Machine

The same accuracy of every detail is built into Wildman Circulating Knitting Machinery as goes into the making of the finest watch.

The Wildman machines wear longest because there is least friction on moving parts. And "speeding up" is possible without injury to the cloth.

This explains Wildman Circular Knitting Machinery's enviable reputation.

On request we will send the "Wildman Spring Needle Body Machine Instruction Book" giving detailed illustrations and descriptions of every important part of the machine.

TRADE MFG MARK

WILDMAN MFG. CO.

NORRISTOWN, PA.

Production on Knitting Machines

BY G. R. MERRILL.

In this article on knit goods production, only circular machines will be considered. Machinery used in fashioned and other types of work where the action is not continuously carried on, except for replenishing yarns and repairing breaks, will be omitted because of the large number of possible variables which might enter into the problems. Of course, the principles used in this text are quite applicable to some of these cases, but to leave no grounds for misunderstanding, the article will treat only of machines having practically continuous production.

There is more than one point of view for working out the production of a machine.

If the production of some machine which is in operation is desired the following facts need to be determined:

1. R. P. M. of needles or cams,
2. Number of feeds,
3. Percent of time stopped during the day,
4. Courses per inch in the cloth,
5. Weight per linear yard of fabric made.

Using the figures obtained from the machine as it is operating, multiply the r. p. m. by the number of feeds. This gives the courses per minute. Basing the production on an eight-hour day, it is now necessary to multiply the courses per minute by the minutes per day (480). This gives us the total number of courses knitted per day, if the machine runs all of the time on a basis of eight hours.

Dividing this total number of courses per day by the courses per inch gives us the number of linear inches of fabric made in the day. Again dividing this by the inches per yard (36) gives the total number of yards per day, if the machine runs all the time.

Finally, multiply this yardage per day by the weight of each linear yard and get the weight per day produced, at 100 per cent efficiency. Then multiply the weight produced by the per cent of the day the machine is running and this figure is the actual production per day.

Take, for example, the following data to determine the production in pounds per eight hours: 36 r. p. m. of a 20 inch cylinder, 8 feeds, 15 per cent stops, 18 courses per inch, and .552 pound per linear yard. Multiply the r. p. m. by the number of feeds, $36 \times 8 = 288$, and the number of courses per minute is 288.

To find the courses per day, multiply 288 by 480 and get 138,240 courses per day.

Dividing these courses per day by 18, the courses per inch, the result is 7,680. $138{,}240 \div 18 = 7{,}680$ inches per day and this number, when divided by 36, gives 213.33 linear yards per day. $7{,}680 \div 36 = 213.33$ yards. This number of yards at .552 pounds per yard gives 117.76 pounds per eight hours of actual running.

$213.33 \times .552 = 117.75816$ lbs. But this amount, when multiplied by .85 to get the actual production, $117.75816 \times .85 = 100.094436$ or it becomes practically 100 pounds.

There is, of course, no need of carrying the decimal figures to the extreme shown here, but two decimal places might well be considered.

This whole problem may be combined into one equation and solved by the same reasoning but more quickly. Thus:

$$\frac{36 \times 8 \times 480 \times .552 \times .85}{18 \times 36} = 100 \text{ pounds}$$

Another method for solving a production problem which uses the yarn size and not the weight per yard of the cloth requires that the following data be collected.

1. R.P.M. of the needles or cams,
2. Number of feeds on the machine,
3. The per cent of time stopped during the day,
4. Stitches per foot of yarn,
5. Total number of needles in the machine,
6. Size of the yarn used.

Dividing the total number of needles by the stitches per foot of yarn (or the number of needles for which one foot of yarn makes loops) determine the feet of yarn in one course. Multiply the feet of yarn in one course by the courses per minute (which is found by multiplying the r. p. m. by the number of feeds and then by the minutes per day (480) and get the total number of feet of yarn used per day when the machine makes no stops.

Divide the number of feet of yarn by three and find the yards per day used. Then divide the yards of yarn by the yards per pound, and the result will be the production in pounds per day of no stops. So, then multiply this number of pounds per day by the per cent of the time which the machine is running and get the actual production per day.

The yards per pound of any yarn is equal to the size or number multiplied by the yards in one hank. A hank is 840 yards in cotton, 560 yards in worsted, and 1500 yards in woolen.

Take the following conditions as illustrative for this method: 50 r. p. m. of a 20-inch cylinder, 4 feeds, 20 per cent stops, 40 stitches per foot of yarn, 490 needles in cylinder, and 4's yarn (cotton). Following the previous directions, divide 490 by 40 and find that there are 12.25 feet of yarn used per course. Then 12.25 feet multiplied by the courses per minute, $4 \times 50 = 200$, gives 2,450 feet of yarn used per minute. This means $480 \times 2{,}450 = 1{,}176{,}000$ feet of yarn per day with no stops. 1,176,000 feet of yarn is 392,000 yards of yarn.

Of number 4 cotton yarn, there are 4×840, or 3,360 yards per pound. Then, $392{,}000 \div 3{,}360 = 116.67$ pounds of yarn used for eight hours running time, which becomes when multiplied by .80, 93.34 pounds of actual production for the eight-hour day.

This may be solved in one equation as follows:

$$\frac{490 \times 4 \times 50 \times 480 \times .80}{40 \times 3 \times 4 \times 840} = 93.34 \text{ pounds.}$$

Efficiency in management is destined to be the biggest factor in the future success of industrial concerns. This will be true not only in connection with domestic competition, but also, and especially, in foreign competition. We urge clients to make a study of costs and quality an important part of their activities during the period just ahead of us.—*Babson.*

ALWAYS FIRST WITH — THE — LATEST

BANNER

ALWAYS FIRST WITH — THE — LATEST

FULL AUTOMATIC

HOSIERY MACHINES

SIMPLICITY — SPEED — PRODUCTION — QUALITY

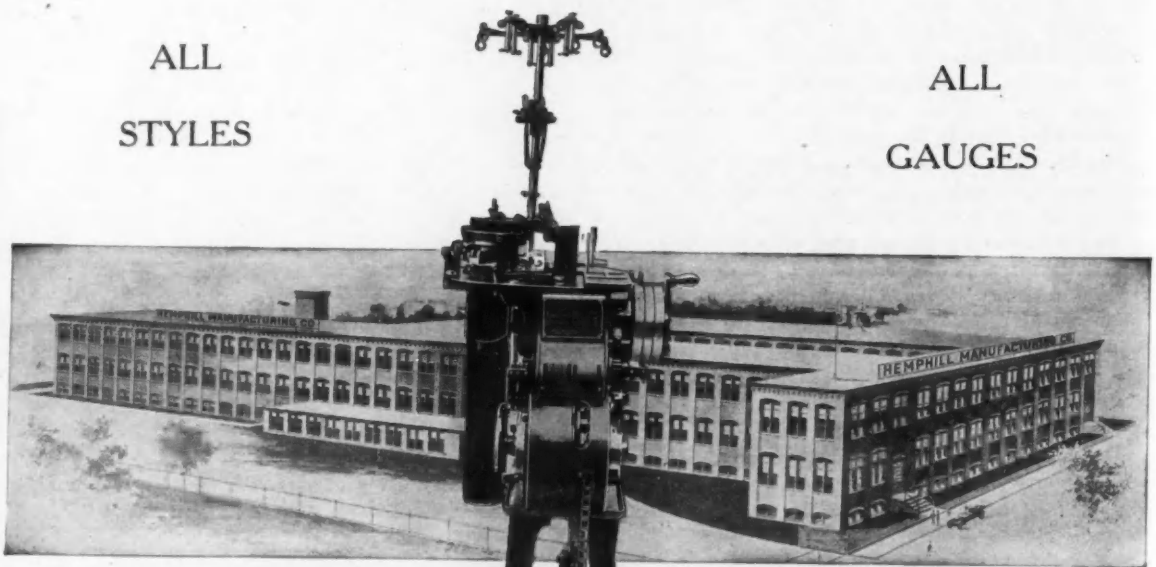
Four important things to consider when buying Hosiery Machinery.

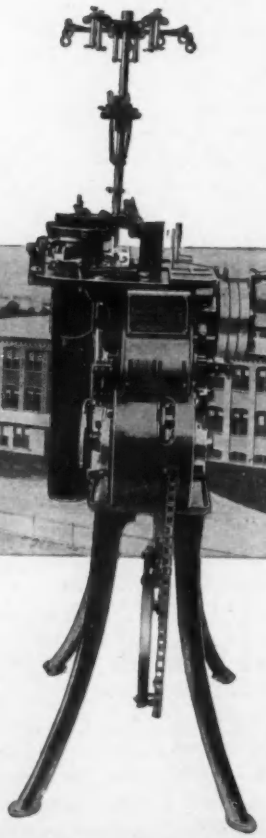
ALL PARTS ACCESSIBLE FROM FRONT OF MACHINE

Write for descriptive catalog

ALL STYLES

ALL GAUGES





HEMPHILL COMPANY

Main Office and Factory,

Pawtucket, Rhode Island.

Southern Office and Show Rooms
912-913 James Bldg., Chattanooga, Tenn.

Philadelphia Office and Showrooms, Rooms 205, 209, 210, Colonial Trust Company Bldg., 13th and Market Sts., Philadelphia, Pa.

The Knit Goods Market

With the end of July the knit goods market is believed to have gone through the dullest period of the year. During the several weeks of almost complete stagnation there was slowly developing a better sentiment, which had its reflex in a somewhat keener interest in low end cotton hosiery, which continued, however, to move only at very low prices.

Chief interest in hosiery lines, aside from full fashioned silks, was centered in infants' socks for spring. Most of the manufacturers opened their lines and named prices substantially under those at which the socks have been sold for fall. Buyers had been alert for some time in advance of the opening, eager to get a line on the new values. Even before these were finally decided on there was some buying at open prices, and by the end of the month a considerable number of the front-rank jobbers had bought for the greater part of their spring needs, according to several manufacturers. Their attitude toward the socks is taken to mean they were confident prices had gone to or about the bottom.

The early buying in quantity may be explained by the fact that during the last several months there developed a scarcity of socks, and a number of large distributors were caught short at a time when deliveries were much desired. By placing orders in July they will be assured of satisfactory deliveries for next year, and manufacturers will be enabled to begin work on spring goods the moment they have completed their fall orders.

Full fashioned silk hosiery is the one absolutely scarce article in knitted goods. The famine is due, of course, to the strike against which 14 Philadelphia mills and one—a large one—in Fort Wayne, Ind., have been contending since January 1. The controversy appears no nearer termination than six months ago, and, for the first time since it developed, jobbers really are seriously alarmed as to where they will obtain supplies for the first quarter of 1922. There is a strong intimation some of the jobbing houses are negotiating in European markets for full fashioned silk hosiery, which, it is understood, can be brought in and laid down in New York for less money than the cost at mills in this country operated on the closed shop basis and paying the union scale of wages.

Even were the strike to be settled at once, some weeks would elapse before mills could be turning off normal production, for much of the idle help has found employment elsewhere and, while new help is being trained, it will be weeks before the learners will be skilled operators, and complete mill organizations cannot be had for some time. The prospect of a supply of domestic full fashioned silk hosiery sufficient to meet demands next spring is not encouraging.

Several new full fashioned mills are about to start operations in a small way, but these will not be able to materially relieve the tight situation. The Silike mill, in Philadelphia, is installing six machines and in a few months will add a few more. The Albert Hosiery Mill contemplates increasing production. Another addition to the full fashioned industry in Philadelphia will be the Endurance Knitting Company. There would be more rapid expansion of this division of the knitting industry if machines could be turned out as fast as wanted. Production of full fashioned machinery, while greater in this country than at any time in the past, is far behind demand, and probably will not catch up before the fifteen idle mills get back to work. The scarcity of full fashioned silks, in conjunction with the radical drop from the war-time price peak, has served to give them wider popularity, so that, it is felt, even with all the new machinery and the now idle mills at work, the market will absorb about all that can be produced. If this prove to be true, seamless silks may be hard hit.

Seamless silk hosiery for women has enjoyed a good run for some months, but in anticipation of settlement of the full fashioned strike, jobbers have bought sparingly, only for immediate and nearby needs. Any sagging in the seamless may have an adverse effect on mercerized lines, which have been draggy ever since the decline set in about fifteen months ago.

It is believed mercerized hosiery would command more respect if retailers were willing to sell it at prices based on cost at mills plus a normal profit. For months jobbers were clamoring for a mercerized stocking for women to retail at 50 cents a pair. Manufacturers more than met them, making it possible for jobbers to obtain very good lines at $2.50 a dozen. One manufacturer specifically is selling to jobbers a stocking intended to be sold in retail stores at a half-dollar a pair, and boasts that it represents better value than its 50-cent stocking before the world war.

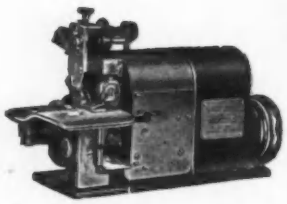
Many retail dealers, it is true, have marked their prices of mercerized hosiery down to about where they ought to be, but some have not done so. A large dealer in particular, operating a number of stores, several weeks ago advertised, as a "special," women's mercerized stockings with reinforced heel and toe "value 80 cents; sale price 69 cents." For many weeks this particular type of stocking has been available to jobbers at $2.50 a dozen, and to retailers at $3.25. At 69 cents a pair the consumer was providing for profits of more than twice what the manufacturer was paid for the stockings—profits of $5.03 absorbed somewhere between the mill and the customers' side of the counter.

Retail prices and the unwillingness of union labor to work at the best wage employers might be able to pay constitute the chief obstacle to good business. "We were accustomed to look on spinners as past masters in the art of profiteering," said a southern manufacturer while in the North a week or two ago, "but I find they don't know anything about profits. Retailers have got it all over the spinners."

Retailers assert they must have abnormal profits because, for one reason, rents are excessively high. Rents are high only for the reason building mechanics refuse to work for a wage that would permit builders to operate and capitalists to invest. The patient consumer is paying the cost of the blunder of trying to maintain peak prices while the world is working toward a lower price level. The consumer is paying the cost of the strike among the full fashioned hosiery mills. Jobbers agree that, by reason of the strike, this class of hosiery is costing them five to six dol-

MERROWING

ESTABLISHED 1838
MAKERS OF



THE MERROW HIGH SPEED

OVERSEAMING; OVEREDGING
AND SHELL STITCH MACHINES

MERROWISE

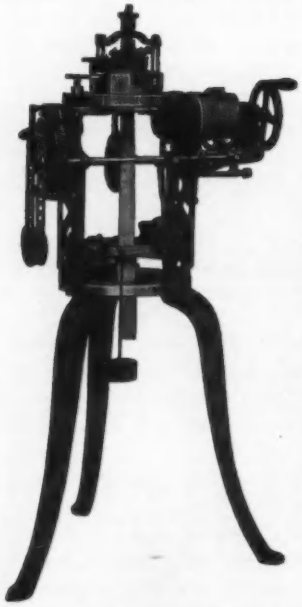
FOR EFFICIENCY
IT MEANS

MAXIMUM PRODUCTION
MINIMUM EXPENSE
UNEXCELLED QUALITY OF WORK

THE MERROW MACHINE COMPANY

16 LAUREL ST., HARTFORD, CONN., U. S. A.

H. BRINTON CO.



Builders of

Circular
Knitting
Machinery

of every kind for every purpose

Hosiery Ribbers
with the very latest attachments

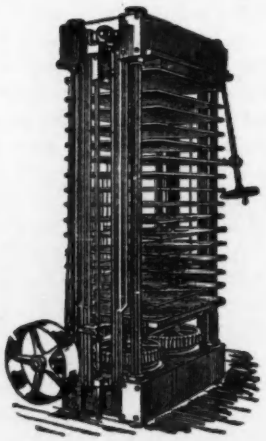
Full Automatic
Hosiery Footers

Body Machines
Sleevers, Etc.
for Underwear, Sweaters, Toques, etc.

Write for Catalog, Prices and Samples

213-217 Race Street, PHILADELPHIA, PA.

Canadian Agent: Hartley Kay, Ltd., Georgetown, Ont.



RELIANCE

Hot Plate Screw Press
FOR
Hosiery and Underwear

Write for Catalog and Prices

Reliance Machine Works
FRANKFORD, PHILA.

lars a dozen more. By the time the increase of 50 cents a pair reaches the retailer it mounts to 75 cents.

Some of the full fashioned mills operating at capacity and not concerned with the union or the closed shop are known to be getting a full five dollars a dozen less than mills in which the labor organization is permitted to dominate. Thus it costs manufacturers paying the union wage nothing to do so—they simply pass the added cost along to the jobber, who hands it to the retailer, with a slight addition, and the retailer adds just a little bit more.

While silk hosiery mills are idle because operatives refuse to work except on their own terms, among cotton hosiery establishments there is idleness for the reason jobbers will not pay the price. It's all a matter of price. One of the very large mills some time ago, when jobbers were refusing to operate, named prices at and below replacement cost. Now the mill finds it is losing too much money and wants its selling establishment to advance prices. The selling house says this cannot be done at this time successfully; that jobbers will not buy rationally at prevailing prices and would not buy at all if advances were made. The retort of the mill is "We cannot continue to lose money."

Here is a deadlock between mill and jobber that was not taken into the reckoning when the mill went under the bottom with its prices, and it may be forced to do now that which it might have done then with no more disastrous result—close down until the jobber was willing to pay a price that would permit the manufacturer to live at least half way up to the American standard. One southern manufacturer—in South Carolina—reports his mill has been idle since last November.

There is far less wholly idle machinery than last year, of course, but many of the mills making cotton goods are operating short time and some have discontinued the manufacture of unprofitable lines, turning attention to types of hosiery which yield some little return. There has been a cutting down of the production of misses' coarse gauge ribs, and throughout the range of cheap cotton goods, production and consumption appear to be better balanced than at any time in the last twelve months. This condition probably explains the better interest in low end goods, of which some manufacturers feel there will be less on the market a few months hence than the trade might be able to turn over.

At this range it looks as though it would be a mistake to anticipate any such demand as might work toward stiffer prices. It will be a very difficult matter to move prices up while the trend in commodities generally is downward, and it would be dangerous to make up cheap hosiery for stock for meeting any demand such as now seems to be developing. It should not be forgotten that the supply of machinery is greater than is necessary for making all the cotton hosiery the domestic and foreign markets will absorb.

Exports of cotton hosiery in May were only 191,765 dozens, as against a monthly average of more than 1,000,000 dozens last year, when the knitting industry of the United States was nearer to complete stoppage than at any time in the history of knitting. The total exports for the first five months of this year were 1,190,125 dozens. More than that many dozens were exported in each of four months of 1920.

The future of this country's export business in, as well as its imports of, hosiery, seems uncertain. While in a few price ranges the prospective new duties favor the importer, the dye and chemical schedule of the tariff bill now before the Senate would seem to operate against the American manufacturer. The cost of one of the intermediates, it is shown in an analysis of the schedule in the Fordney bill, was 10 cents a pound before the war; present price 38 cents; the proposed duty is 184 per cent of the pre-war cost. For another the pre-war price was 17 cents, present price 85, and the new duty will be 190 per cent of pre-war selling price. On still another, selling at 35 cents pre-war and $1.15 now, the duty alone is 118 per cent of the price before the war. On six dyes the proposed duty ranges from 116 to 402 per cent of the pre-war prices. Thus dyeing seems certain to cost more, and under the license and embargo features of the dye and chemical schedule, manufacturers may be at a serious disadvantage in trying to obtain some of their colors. Meanwhile foreign stockings dyed in colors made in other countries are coming in.

A Philadelphia mercerizing establishment recently obtained samples of German-made socks for infants and at once dyed yarns to match the shades used in the imports. Sample cones of dyed yarns were supplied to a number of manufacturers, and they are carrying the shades in their sample lines. It is regarded a foregone conclusion that in the strife for the hosiery markets of the world the German manufacturers will not be slow to supply shades which at this time are available only in Germany. Thus it appears there are obstacles which American manufacturers must overcome if they are to compete successfully in foreign markets.

Underwear probably is the more stagnant of the major divisions of knitted goods. While there appears to be confidence among some jobbers in prices which have been named for light weights for spring of 1922, these same jobbers probably have not bought more than 25 per cent of normal requirements for fall of 1921. It is the estimate of a person well up in the trade, who is in close touch with leading mills, that since December last not over 15 per cent of the normal production of winter underwear has been turned off. Many mills are idle and have been for some time; many others are operating on short time. By September there either will have developed a scarcity of heavy weight underwear for fall delivery or it will be shown there was more carryover stock from last winter than most persons have been willing to admit. If supplies run short, jobbers with leftovers will profit handsomely on stocks on which their losses were written off in the inventories of the first of the year. In any event, higher prices than were named at the opening of the selling season early in March seem likely, and, as usual, the cost of parsimonious buying by the jobbing trade will fall on the consumer.

A peculiar situation exists in relation to light weight underwear for next spring. Some few jobbers have bought a little, to the amazement of others, and there are jobbers who would like to buy now. But there is another element among the distributors that counsels buyers to hold off until about September 1st. This element was represented at a meeting of committees of underwear manufacturers and members of the Jobbers' Association of Knit Goods Buyers in New York on July 8. A formal report of the meeting issued from the office of the National Wholesale Dry Goods Association says: "Reference was made to the belief that opening earlier than necessary tended to demoralize the market, while opening earlier than manufac-

turing conditions justified would have an equally bad effect."

The committees were in apparent accord that the opening should be deferred until August 15 and take place not later than September 1. There was manifest a desire to avert a repetition of the unsatisfactory conditions prevailing during the selling this year for the current retail season, a condition chargeable to the unwillingness of jobbers to operate in time to enable manufacturers to complete deliveries. It was admitted that the blame for much of the "poor merchandise" could be laid to "production under rush conditions." Manufacturers could not escape the rush, for jobbers deferred buying until the latest possible moment and then, mostly, bought for only 30 days, and some jobbers cancelled their orders when a delivery ran a few days late.

That jobbers are not in accord with the proposal that buying for next spring be deferred until August 15 at the earliest is indicated in that part of the formal report of the meeting which says: "It is well known that some of the manufacturers and some of the buyers have transacted some small business and, of course, the committee entertains no objection to this, merely expressing the view that the best interests of the trade would, in their opinion, be served by a general transaction of business between August 15 and September 1."

As a matter of fact, some quantity orders for underwear for next spring already have been placed—were on the books before the joint committee had its meeting. One order, it is stated, calls for approximately 18,000 dozens of ladies' union suits and vests, the larger part of the order, of course, calling for suits. The mill's price for next vear is said to be 25 per cent under the lowest price at which the garments were sold for this summer.

Jobbers who are not inclined to operate in spring underwear until about September 1 admit that buyers who can finance transactions at this time would be justified in plaing their orders for nearby delivery; that declines, if any, will be so slight that no one would suffer any material loss; that any loss that might be sustained would be more than compensated for in satisfactory deliveries and better merchandise as a result of the absence of confusion due to "rush production." Wage reductions, it is held, if any, will be by easy stages, not more than five per cent at any time, and it is not believed yarns will decline to an extent that might disturb the market.

It should not be surprising if considerable of the underwear for spring 1922 were bought before the time designated in the meeting in New York. Manufacturers will want to keep their machinery going for holding their organizations intact. They will be disposed to accept business for good accounts on a cash basis. One proposal is that if the mill hold the underwear for late delivery it charge the buyer the usual rate of interest for the time delivery be held up, and that if buyers who take the goods in as finished or within reasonable periods they be given the discount usually allowed when accounts are anticipated.

But it will be necessary for manufacturers selling early to scan credits very closely. There is an element in the jobbing trade that is eager to buy now, intending to take the goods if the market remain firm and cancel on the slightest decline. The number of this class of jobbers offering orders to mills usually very careful in opening accounts is amazing. Concerns who can no longer buy from manufacturers with whom they had been dealing are going to mills with early orders. Most of the mills approached by a new customer scent something wrong in the reputation of such customer, and generally decline the account.

Every order for distant delivery ought to be a signed order, and should have the seller's confirmation. No loophole through which the buyer might crawl in attempting to evade his contract should be permitted. Sellers, with large sums invested in yarns and labor, will be at the mercy of dodging jobbers with whom they have transactions unless their contracts are properly safeguarded. It would seem that the experience of last year and the year before would be sufficient for putting every manufacturer on his guard. Every garment ought to be carefully inspected before leaving the mill, and there should be no doubt that goods be as nearly flawless as possible; that there be no firsts among seconds, and that the packer's count be verified. Unprincipled buyers have found that an easy way to evade their obligations is by finding fault with the merchandise or setting up a claim for alleged short count. The stability of the market is in the hands of the manufacturers.

The Truth in Fabric Bill.

Knit goods interests probably will be drawn into the fight against the Bill of Senator Capper which bears the alluring designation "Truth in Fabric Bill." The measure, which has been hotly discussed at several hearings before a sub-committee of the Interstate Commerce Committee, applies to only woven cloth made wholly or in part from wool, and the yarn entering into the manufacture of such cloth going into interstate commerce.

The bill provides that on every yard of woven cloth containing wool there shall be stamped a description showing the per centum by weight of the several component parts—virgin wool, shoddy, cotton and silk. Cloth containing reworked wool, cotton or silk must be so stamped that the several component parts will be described as "shoddy."

In the first place, there is serious objection to the employment of the word "shoddy," a term which usually is misunderstood by the consuming public. Going further, it was shown at the hearings that a cloth made from what is described as shoddy may be of better value than another cloth made from "Virgin" wool. Thus a piece of cloth stamped "Virgin" wool might appear to an innocent purchaser to be of higher value than another bearing the description "Shoddy," and the consumer would be deceived by the language of the Bill, which, it is stated by its author, is intended to prevent deception.

At a recent hearing before a Senate sub-committee Charles J. Webb, the well known wool merchant of Philadelphia, submitted four samples of "Virgin" wool. "You cannot make as good cloth from that wool as I can make from what you call shoddy," he said. The contentions of Mr. Webb were borne out by General John P. Wood, a cloth manufacturer, of Philadelphia.

The Capper Bill, it is believed, if enacted into a law, would prove the beginning of a flood of further hampering legislation. It is regarded as in the exclusive interests of the wool growers, but once the reformers succeed in compelling the use of the word "Shoddy" as a descriptive term

for reworked wool in cloth they will, there seems no doubt, go after the knitting manufacturers. The knitting industry would find it quite difficult to describe stockings made from wool and silk, or mercerized yarn and fiber silk, in such a way as would be satisfactory to the captious agitator in behalf of the security of the consumer. This would be true especially of heather mix hosiery made from a combination of yarns. Under the Capper Bill yarn containing wool could be sold only in interstate commerce when accompanied by a full description of the content, and the description would have to be accompanied by the seller's guarantee. Clothing made from woven cloth sold in interstate commerce would be required to carry a white cotton tag or label written upon which would be a description conforming to that stamped on every yard of cloth going into the article of clothing.

It will be seen that the application of the same system of compulsory stamping and marking to hosiery and underwear, and sweaters as well, would entail considerable costly work on the part of the manufacturer, while serving no purpose in protecting the consumer and leaving him or her perhaps more confused than if the stockings or other knitted article were not marked as to their wool content.

The Capper Bill provides for compulsory marking. A bill by Senator Lodge, known as the "Honest Merchandise Law," establishes a penalty for misbranding, but does not make branding compulsory. The Lodge Bill also provides penalties for the use of misleading advertising matter. Interests opposed to the Capper Bill would be well satisfied with the enactment of the Lodge Bill, which would not carry exclusive benefits to any one industry.

Among the Knitting Mills.

The Linda-Lou Underwear Co., Fort Wayne, Ind., has filed notice of increase in capital from $10,000 to $25,000.

The Ansonia O. & C. Co., Ansonia, Conn., manufacturer of cotton lacings, webbings, braids, etc., has received bids for the construction of a new mill and power house. The works will be two-story and basement, 75x250 ft.. brick and reinforced-concrete construction. Lockwood, Greene & Co., Boston, Mass., are engineers for the project. A. T. Terrell is president of the company.

The Herman Schwartz Co., Philadelphia, Pa., is being organized by local interests to manufacture knit goods. Application for a state charter will be made on July 19. The company is represented by Wolf, Block & Schorr, Real Estate Trust Building.

D. J. Rothstein, formerly associated with the Knit Wear Corporation, Philadelphia, Pa., has established a plant on Mascher Street, near Columbia Ave., for the manufacture of cotton jerseys, bathing suits, etc., it is reported.

The Capital Knitting Co., Cohoes, N. Y., has filed notice of dissolution under state laws.

Sheplan, Sabul & Palmer, Philadelphia, Pa., have awarded contract to the Wark Co., 231 South Broad Street, for the construction of their proposed new three-story knitting mill, on site recently acquired at Forty-third Street and Lancaster Avenue, 63x158 feet. The structure is estimated to cost about $150,000.

The Wayne Knitting Mills, of Fort Wayne, Ind., which are establishing a branch mill at Los Angeles, Calif., have appropriated $200,000 to cover expenses in connection with the project.

The Chester Knitting Mills, of St. Louis, Mo., are to establish a mill at Belleville, Ill., and will start with about 75 employees.

The Adams Hosiery Corporation, Chicago, Ill., has been organized by Harry Kalven and others, 319 W. Adams St., Chicago.

S. Augstein & Co., of New York City, have awarded a contract for the erection of a new three-story reinforced concrete mill at Elmhurst, N. Y., 140 by 80 feet, estimated to cost about $95,000.

The Wateo Knitting Co., Phoenixville, Pa., has plans under way for the erection of a three-story addition to its mill, to be 36x80 feet.

The Southern Hosiery Mills are completing the construction of their new mill at Burlington, N. C., to replace the building which was destroyed by fire last April.

The Volunteer Knitting Mills, Chattanooga, Tenn., have been organized by A. W. Chambliss, E. B. Thomason and others, with a capital of $20,000. The company has leased the Lookout Knitting Mills plant for the production of boys' knit underwear.

McKeough and Yates, who recently organized a company at Fultonville, N. Y., for the manufacture of silk hosiery, have started operations in leased quarters.

The Oliver Knitting Co., Philadelphia, Pa., has leased the entire second floor of the building at Hancock Street and Allegheny Avenue, comprising about 11,000 square feet of space, for a period of years, as the site for a new local plant.

The Faultless Glove Co., Gloversville, N. C., manufacturers of gloves and mittens, has removed its equipment from the factory in Burr Street to new quarters in a building in South Main Street.

The Interwoven Mills, Inc., Martinsburg, W. Va., are now occupying the new addition recently added to their plant.

The branch plant of the Perkins Hosiery Mill at Birmingham, Ala., has started operations with about 50 employees.

United States Knitting Co., Central Falls, R. I., have increased their capital to $175,000.

The Firsching Knitting Mills, Utica, N. Y., have increased their capitalization to $500,000.

Eastern Knitting Mills, New York, have leased space at 126 West 32nd Street for a new establishment.

Charles J. Krug, of Riverside, N. J., formerly connected with William F. Taubel, Inc., has started the manufacture of women's fine hosiery in a plant at Riverside. The plant is equipped with 24 knitting machines.

A most important addition to the "National" series of direct dyes is "National" Erie Fast Scarlet YA, a direct red possessing good fastness to light and superior fastness to acid. This new dye is distinguished by its vivid scarlet shade and its general adaptability wherever direct dyes are employed. Among other good properties it possesses excellent solubility, produces level shades, and resists the action of metals, thereby rendering it eminently suitable for use in any of the standard dyeing machines. It is said to be especially useful for dyeing cotton in all stages of manufacture, including warps, and on account of its qualities is of great value for linings, sateen quiltings, tickings, etc.

Perhaps we can give you the information

The superintendent of a mill wanted a lot of special corrugated paper boxes. We told him where he could get them.

Another superintendent wanted information as to where he might obtain some 2,000 horsepower of boilers. We gave him the names of several possible sources of supply.

So it goes. This service is free to readers of COTTON. We are always glad to be of assistance in filling your wants. Our files contain the names of manufacturers and dealers in every article or supply you can possibly want.

Let us help you find the things you need. Look first through the advertising pages of COTTON, then if what you want is not advertised write us.

We promise to give you immediate service. We know that we can be of assistance to you.

COTTON, Grant Bldg., ATLANTA

JOSEPH T. PEARSON & SONS CO.

MANUFACTURERS OF

BONE DRY HOSIERY FINISHING BOARDS

THAT WORK ABSOLUTELY SMOOTH

PROMPT SERVICE—RIGHT PRICES

1815 E. Boston Avenue, Philadelphia

F. & S. Peerless Compound

—Saves—

COAL—TIME—LABOR

A HIGH solvent having great penetrating, free rinsing and non-destructive qualities. Extracts all natural impurities from cotton in a 4-hour boil-out without damage to the natural life of the fibres.

It is to your interest to advise with us.

Wm. Taylor Stearns, Dept. C, New York

Sole Selling Agent 874 Broadway

GENERAL MACHINE WORKS

YORK, PA.

Manufacturers of

Circular Rib Knitting Machinery

Cylinders and Dials

50% Better than ever from YOUR Standpoint

SEVERAL NEW FEATURES have been added to the "1912" Cloth Cutting, Folding and Winding Machine which add at least 50 per cent to its value to YOU.

It will cut your cloth—fold the edges—roll it up and give you an exact measurement of every piece of cloth going through the machine.

It saves time, labor, machines and cloth.

YOU ONLY NEED ONE MACHINE where before it required two, and you get an extra strip from every bolt of cloth.

It cuts the corners of expense in every way and leads to more and greater profits.

THE ENORMOUS SAVING WILL INTEREST YOU.

Mail a card for complete information and prices.

When in need of special machinery, write us.

F. A. FIRSCHING, 614 Broad St., Utica, N.Y., U. S. A., Dept. "C."

Knitters Object to Reports.

An informal canvass of knit goods manufacturers discloses widespread opposition to the proposal of Secretary of Commerce Hoover that these manufacturers each month supply the Department with reports of the month's production, the qualities of product remaining unsold and the per centum of output in relation to the whole.

Some manufacturers say that already they are required to supply so many reports that the compilation of additional statistics at stated periods would entail more clerical work than they are prepared for, and they would not favor the Hoover proposal under any circumstances. Others would be willing to submit reports if like informing reports were supplied by spinners and jobbers, but few manufacturers subscribe to the idea that it would be a good thing for the industry if the department were to send summarized reports to all manufacturers in kindred lines. The fear is expressed that reports of manufacturers might fall into the hands of persons not entitled to them; that, in the light of experience, there is danger of departmental leaks; that department clerks coming into possession of valuable information from manufacturers might be persuaded to resign their jobs to accept employment in the office of some manufacturer competing with those reporting, their knowledge of stocks and conditions in mills constituting a valuable asset to those seeking positions in mill offices.

It is pointed out that prior to the world war few of the reports of the character now desired or required were submitted to governmental departments; that the knitting industry thrived vastly and, at the entrance of this country into the war, proved itself ready to supply the needs not only of this country but of a great part of the allied armies as well, and that now, since the country is at peace and the industry is on a substantial basis, no such reports are necessary for either the government or the industry.

Knitting interests in the main are in accord with the aphorism of President Harding—"Less government in business," and, judging from the attitude of maiufacturers whose views have been obtained, knit goods monthly statistics are not likely to be reported except under compulsion. Secretary Hoover has stated to representatives of manufacturers that it is not his desire to exercise a privilege, under the law, of compelling them to supply reports of the character referred to.

[It is only fair to Secretary Hoover and the Department of Commerce to state that such confidential reports are handled under code numbers known only to the mill and the head of the Bureau of Census, and under no circumstances would the clerks compiling the statistics be allowed to consult the code number sheet and thus identify the product of any individual mill.—The Editors.]

Hosiery Tariff Unsatisfactory.

A determined fight against the hosiery schedules in the Fordney Tariff Bill seems likely, and there is promise that manufacturers who, it is found, would be seriously affected if the bill were to be enacted in its present form, will be heard when the measure reaches the Senate Finance Committee.

Many interests believed the duties on hosiery would be on the level of those provided in the Payne-Aldrich Bill of 1909. To the amazement of these interests, the Fordney Bill came out with duties lower, even, than those in the Underwood Bill of 1913. On cotton hosiery of a value of $1.21 to $2 a dozen the Fordney duties are lower by as much as 11¼ cents a dozen on at least one price range. Where the Fordney duties are higher than those in the Underwood Bill the difference is slight.

The Underwood Bill provided for only ad valorem duties, whereas in the Fordney, as well as in the Payne-Aldrich measure, specific as well as ad valorem duties are specified. It should not be overlooked, when comparing duty rates under the several bills, that the word "Value" in the Fordney measure means the value of merchandise in the American markets on the date when the imported merchandise started from the exporting country to the United States.

Manufacturers of silk hosiery claim to be especially hard hit by the Fordney Bill, which imposes only an ad valorem duty of 40 per cent as against 50 per cent in the Underwood Bill and 60 per cent in the Payne-Aldrich. Stockings valued at, say, $20 a dozen paid a duty of $12 while the Payne Bill was in effect; $10 under the Underwood-Simmons, and would pay only $8 under the Fordney Bill.

The Fordney duties on cotton underwear would be considerably lower than under the Payne-Aldrich but comfortably higher than the Underwood.

The following table shows the rates of duty on cotton hosiery and underwear as provided for in the Fordney and Payne-Aldrich Bills:

	FORDNEY BILL DUTIES		PAYNE-ALDRICH DUTIES	
COTTON HOSIERY Value Per Doz.	Specific	Ad Valorem	Specific	Ad Valorem
$1.00 and less....	$0.35	12½%	$0.70	15%
$1.01 to $1.50 ...	.45	12½%	.85	15%
$1.51 to $2.00 ...	.65	12½%	.90	15%
$2.01 to $3.00 ...	1.20	12½%	1.20	15%
$3.01 to $5.00 ...	2.00	12½%	2.00	15%
$5.01 and more ...		35%		55%
COTTON UN'WEAR Value Per Doz.				
$1.50 and less ..	$0.40	12½%	$0.60	15%
$1.51 to $3.00 ..	.70	12%	1.10	15%
$3.01 to $5.00 ..	1.20	20%	1.50	25%
$5.01 to $7.00 ..	1.40	25%	1.75	35%
$7.01 to $15.00 .	2.25	25%	2.25	35%
$15.01 to $20.00 .	4.00	28%		50%
$20.01 and more...		40%		50%

In the following table are shown the duties collected under the Underwood and Payne-Aldrich Bills on cotton hosiery and underwear of varying values, and the duties collectable under the Fordney. The differences in favor of the importer are shown in the range of hosiery from $1.25 to $2 in value:

COTTON HOSIERY	UNDERWOOD	FORDNEY	PAYNE-ALDRICH
$0.70 per dozen..	$0.21	$0.43¾	$0.80½
$1.00 per dozen..	.40	.47½	.85
$1.20 per dozen..	.48	.60	1.03
$1.25 per dozen..	.62½	.60⅔	1.03¾
$1.50 per dozen..	.75	.63¾	1.07½
$2.00 per dozen..	1.00	.90	1.20
$3.00 per dozen..	1.50	1.57½	1.65
$5.00 per dozen..	2.50	2.62½	2.75
COTTON UN'WEAR			
$1.50 per dozen..	$0.45	$0.58¾	$0.82½
$2.00 per dozen..	.60	.95	1.40
$3.00 per dozen..	.90	1.07½	1.55
$5.00 per dozen..	1.50	2.20	2.75
$7.00 per dozen..	2.10	3.15	4.20
$15.00 per dozen..	4.50	6.00	7.50
$20.00 per dozen..	6.00	9.60	10.00

The tables, which were prepared from computations made by the statistician of the National Association of Hosiery and Underwear Manufacturers, have served to awaken a deep interest among the trade.

The Yarn Market.

The Philadelphia cotton yarn market for the past month practically repeated itself, bringing over almost similar conditions to those that prevailed during the previous month. Offerings of yarn were numerous, prices were on a receding plane, and inquiry was practically absent. What business was reported during the month as a whole was in the form of occasional orders for small lots from local stocks, chiefly from the knitting trade; carded yarns received practically no attention, and demand for combed yarns remained proportionately more active than for yarns in the carded groups.

In the first week, the slump in raw cotton rates—this was during the latter part of June—affected yarn prices to a degree, causing some spinners and distributors who had on previous occasions even indulged in booms, to make efforts to get out from under. During this period, southern single carded warps, good average white stock, were reported as being on the market at 15 cents for 10s, which was three cents above the low mark of 12 cents in 1914 or 1915. Other yarn prices, particularly in the carded section, seemed down to equally low levels. But, with such conditions, buyers seemed to display no enthusiasm over prices, demand continuing very poor with most of the distributors.

Looking at the market at the end of the next week, business had continued flat in all lines for another week. However, prices held a little firmer and did not yield further, and, it was reported, some dealers did buy moderate lots of special yarns for their own account, picking up some apparently attractive bargains, but all these operations, being in a small way, did not have much of an uplifting or encouraging effect upon the market as a whole.

Yarn prices in this market failed to respond to the advance in raw cotton rates in the early part of July, not budging when cotton picked up a cent on the pound. This was attributed by some to the fact that the recent decline in yarn rates had been due more to a weakening of confidence among holders rather than to any technical adjustment of yarn values to conform with lower cotton.

Dullness continued predominant for the rest of the month, confirming the expectations of most of those in touch with the market, and continuing the precedent which seemed to have been established some weeks back and to which the succeeding weeks evidently wanted to cling.

The fact that yarns failed to improve along with cotton caused discouragement among some factors, regardless of whether or not the rise in raw cotton will be permanent. Another cause for misgivings in some quarters was that a good many of the mills were surprised that their mid-year inventories showed financial losses. Any stocks of cotton goods or cotton yarns which were carried over from last year or were allowed to accumulate during the first six months of the year were almost sure to show a loss when compared with prevailing market conditions, it was pointed out. This being the case, it is urged by the more cheerful factors in this market that it is the year-end inventory that counts and when the relatively light losses of the first six months have been duly written off, the inventory position of the industry at the close of the last six months of the year may be vastly different.

Quotations on electrical yarns in July furnished by H. M. Remington, 113 Chestnut St., Philadelphia, follows:

	80s	100s	120s	140s
Cops	$1.15	$1.25	$1.60	$2.05
Tubes	1.30	1.45	1.90	2.45
Cones	1.45	1.60	2.05	2.60

Recent yarn quotations on the Philadelphia market follow:

Southern Single Skeins.

4s to 8s	19	10s	19½
12s	20	14s	20½
16s	21	20s	22
24s	23	26s	24
30s	26 @27		

Southern Single Warps.

8s	20	10s	20
12s	20½ @21	14s	21 @21½
16s	21½ @22	20s	22 @22½
26s	24 @24½	30s	26 @26½
40s	25 @38		

Carpet and Upholstery Yarns in Skeins.

8s and 9s 3-4 slack	21
8-2-4 tinged tubes	14
8-3-4 hard white warp twist	19
8-3-4 hard twist waste	13½

Southern Two-Ply Skeins.

8s	19	10s	19½
12s	20	14s	20½
16s	21½	20s	22
20s	22	24s	23
26s	24	30s	26
40s	35 @38		

Southern Two-Ply Warps.

8s	20	10s	20
12s	21	14s	21 @21½
16s	21½ @22	20s	22 @22½
24s	23½	26s	24½ @25
30s	26 @26½	40s	35 @38

Southern Two-Ply Combed Peeler Skeins and Warps.

20s	44 @47	24s	46 @50
30s	50 @52	40s	60
50s	65 @68	60s	75
70s	83 @85	80s	90 @$1.10

Southern Frame Spun Carded Yarn on Cones.

8s	20	10s	20
12s	20½ @21	14s	21 @21½
16s	22	18s	22
20s	22½	22s	22½
24s	23	26s	24
30s	26 @27	40s	36 @38
30s double carded			29 @30
30s tying-in			23½ @24

Northern Mule Spun Carded Yarn Cones.

10s	25	12s	26
14s	27	16s	28
18s	29	20s	30
24s	32	26s	33
30s	35	40s	42

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	35	12s	36
14s	37	16s	38
18s	39	20s	39
22s	41	26s	44
28s	47	30s	49
36s	56	38s	58
40s	60		

E. I. du Pont de Nemours & Company, dyestuff sales division, Wilmington, Del., have just issued folders for their loose-leaf book which are descriptive of four new colors recently brought out by them. Pontacyl Fast Violet 10 B is one of these, being an acid color which produces very bluish shades of violet which it is stated do not change in artificial light. It is recommended as suitable for use as a self color for fancy effects on woolen weaving yarns and, in combination with other level dyeing acid colors, for producing navy blues, browns, drabs and olives on slubbing, yarns and piece goods. Pontacyl RL is announced as an acid dyestuff of great tinctorial strength and covering power, which produces red shades of violet; this product is used for self shades of purple, plum, etc., but serves mainly as a component in combination with products like Pontacyl Green S Extra and Pontacyl Carmine 2 B. It can be used for dyeing ladies dress goods in the piece, and also for dyeing slubbing, weaving, knitting and fancy yarns, etc.

Pontacyl Dark Green T is an acid green for producing shades ranging from dark Russian greens to green blacks on piece goods, slubbing, weaving and knitting yarns. Du Pont Milling Red G is brought out to produce deep red shades on wool, and is particularly recommended for the dyeing of yarns, and for dyeing loose wool, slubbing and shoddy.

JOHN D. LEWIS

Manufacturer of

Logwood, Cutch, and Other Dyewood Extracts

TANNIC ACID

Main Office
1209 Turk's Head Bldg.

PROVIDENCE, R. I.

Works
Charles & Bark Sts.

BRANCH OFFICE:

NEW YORK, N. Y.
2-4-6 Cliff St.

PHILADELPHIA, PA.
583 Drexel Bldg.

BOSTON, MASS.
Old South Bldg.

Equip Your Spinning Frames

WITH THE

New "AMTEX" Special

TREATED OILPROOF SPINNING AND TWISTING TAPES

This Tape made from our High Grade Fabrics, treated so that it is absolutely oil and moisture proof, saves time and money by giving twice the wear of ordinary tape, has 25% more tensile strength, grips the spindles insuring a steady smooth pull, and increases production.

Made and Sold by

THE AMERICAN TEXTILE BANDING CO., INC.,

Main Office and Mill
Belfield Ave., & Wister St., Germantown.

Philadelphia, Pa.

Treasurer's Office
23 South Second Street.

J. S. HULME

Atlanta Trust Co. Bldg., ATLANTA, GA

Economy Presses.

Clenzall Dye Machines.

Watson Motors.

Water Softening Systems.

Green Houses.

JORDAN MANUFACTURING CO.

BOBBIN MAKERS

Home Office and Plant No. 1 MONTICELLO, GEORGIA

Plant No. 2, TOECANE, N. C.

Bradley Stencil Machine

The Bradley Stencil Machine makes Stencils in half a minute at reduced cost of 1-10c each. Write for catalogue and price list.

In universal use by thousands of manufacturers and shippers.

Oil Paper, Stencil Paper and Inks.
Bradley Ball Stencil Pot uses Liquid Ink for marking and stenciling. Price 60c or $6.00 per doz. Manufacturers of Oil Stencil Papers.

Write for Prices and Samples

A. J. BRADLEY MFG. CO.

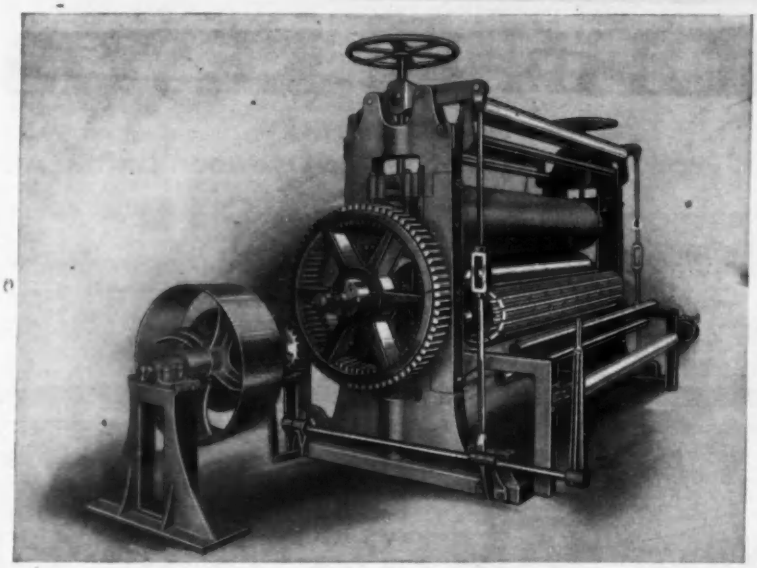
99 Beekman Street NEW YORK

The Walke Box Company, Inc.

NORFOLK, VA.

Manufacturers of

NORTH CAROLINA
PINE BOX SHOOKS



Calender (Three Rolls)

EACH Butterworth Finishing Machine has grown straight out of some real need. That's why each does some one special finishing job supremely well.

FINISHING
Butterworth
MACHINERY

THE BUTTERWORTH LINE INCLUDES

Ageing Machines	Hydraulic Presses	Mangles (all kinds)
Bleaching Machines	Dyeing Machines	Calenders (all kinds)
Drying Machines	Soaping Machines	Color Kettles
Singeing Machines	Tentering Machines	Cell Dryers
Mercerizing Ranges		

H. W. BUTTERWORTH & SONS CO.

Established 1820

PHILADELPHIA

PROVIDENCE OFFICE
Turk's Head Building

Canadian Representative
W. J. WESTAWAY COMPANY
Hamilton, Ontario Canada

Would You like to be Able to Write such a Letter?

"We want to know how we ever got along without the laundry.

"When we bought our laundry machinery we did so with the prospect of indirect returns, by releasing help from home duties and converting this help into mill help.

"After two months' operation, we are pleased to know that we are going to show a direct return on the investment, in addition to the indirect return."

These are extracts from a letter received from the Pacolet Manufacturing Co. of Pacolet, S. C., after its American Mill Village Laundry had been in operation sixty days.

The Pacolet Mills had suffered wash-day competition from the family tub.

The ranks of its women workers were decimated every Monday and Tuesday. Production slowed up, spindles stood idle —but the overhead galloped on.

To meet this condition it installed an American Mill Village Laundry.

It had no thought of a direct return—it did not invest on that basis.

But Pacolet has realized both, and it is learning that the more wholesome home surroundings, the greater contentment and enhanced efficiency of women workers freed from the thraldom of the tub is worth far more than it ever dared hope.

Would you like to share Pacolet's experience?

We maintain a corps of experienced engineers who will be glad to make a survey for you, to present a fair, impartial report showing how your situation can be met. And it will not obligate you in the least.

Surely it's an opportunity worth investigating—do it today.

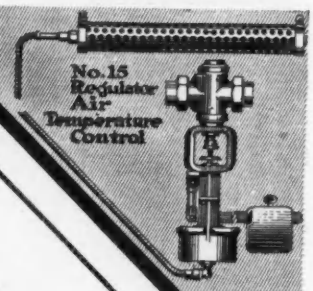
The American Laundry Machinery Company

Specialty Department C, Cincinnati, Ohio

This composite factory group shows the manufacturing plant of the American Laundry Machinery Company, the world's largest producer of laundry equipment, and originator of the American Mill Village Laundry. The service of this organization is sold with every American Mill Village Laundry installation.

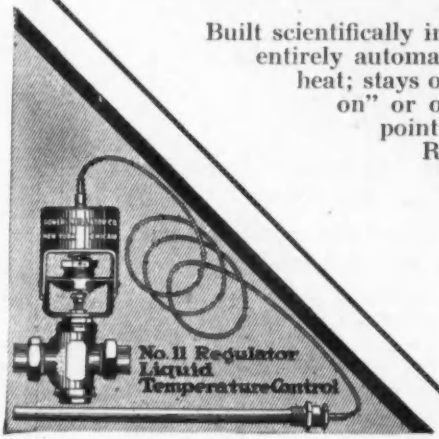
Man's Mind Makes Mistakes

Wherever there is need for maintaining a definite uniform temperature—as in size boxes, dyeing machines, scouring bowls, tentering rooms, etc.—men may forget—but machines cannot. You depend on your men to watch the temperatures, but they are only human, and, as careful as they try to be, they have sometimes allowed valuable material to be spoiled.



The Powers Automatic Heat Regulator

Built scientifically in accordance with known physical laws. Self contained; entirely automatic; can be adjusted to maintain any desired degree of heat; stays on the job every minute and does not **forget** to "turn 'er on" or off when the temperature even **approaches** the danger point. Prevents loss and damage and worry. Set the Powers Regulator and you can **depend** on results.



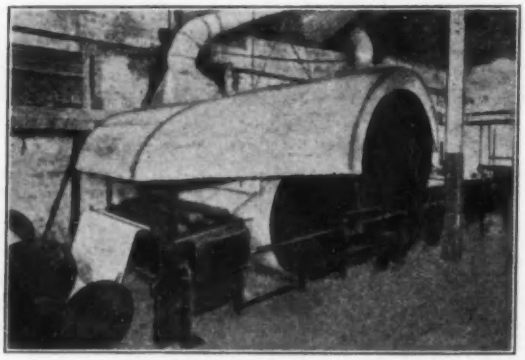
THE POWERS REGULATOR CO
Specialists in Automatic Heat Control

985 Architects Building, New York
2761 Greenview Ave., Chicago
596 Boston Wharf Bldg., Boston
The Canadian Powers Regulator Co., Ltd., Toronto, Ont.

(1263E)

A New Slasher Hood

---improves the sizing proces



Patented by R. O. Pickens

Far better results from the sizing process are effected by the radical improvements embodied in the new *Pickens Slasher Hood.*

The large hood, completely covering both cylinders and the size box, collects and carries away all vapors, eliminates condensation on the yarn and aids in the proper drying of the dressed yarn.

The plan of construction of the hood is in accord with scientific practice and practical experience, making the *Pickens Slasher Hood* the most nearly perfect hood on the market today both from the viewpoints of efficient operation and results attained.

Built in sections of the best grade galvanized metal or copper, the hood may be shipped in knocked down form. This same feature facilitates repairs; only a screwdriver and pliers are needed to replace a rusted section.

Send for further information.

R. O. PICKENS SLASHER HOOD CO.

Spartanburg South Carolina

TOLHURST EXTRACTORS

There's efficiency written in the work of hydro-extraction done by **TOLHURST** machines.

The photograph shows a battery of 40 inch-48 inch **TOLHURST** "Self-Balancing" Extractors operating in a well-known New England factory, famous for its output of worsted dress goods.

The initial machine was installed in 1889 and numerous repeat installations emphasize the satisfactory service consistently given.

We should like to tell you about the notable service these machines are doing in this and other mills. And we should like to demonstrate to you the **TOLHURST** Extractor, suited to your exact requirements.

TOLHURST MACHINE WORKS

Established 1852 **TROY, NEW YORK**

New York Office, 111 Broadway

Southern Rep.:
Fred H. White,
Realty Bldg.,
Charlotte, N. C.

Western Rep.:
John S. Gage,
Hartford Bldg.,
Chicago, Ill.

San Francisco Rep.:
B. M. Pilhashy,
Merchants Ex. Bldg.,
San Francisco, Cal.

Canadian Rep.:
W. J. Westaway Co.
Main & McNab Sts., Hamilton, Ont.
400 McGill Bldg., Montreal.

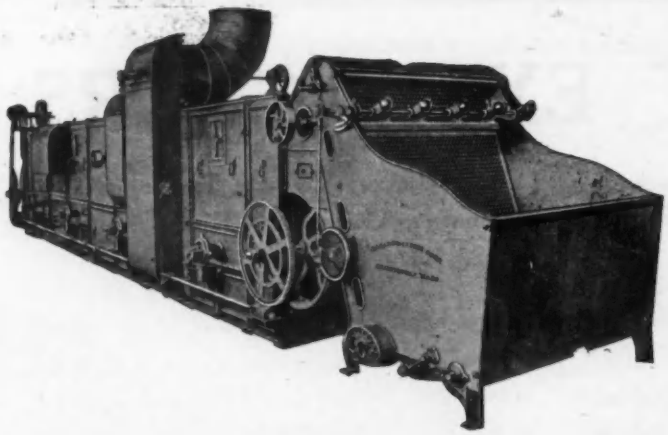
SOFT WATER - CLEAR WATER
FOR EVERY PURPOSE

DECALSO ZERO WATER SOFTENERS
LIME AND SODA WATER SOFTENERS
PRESSURE AND GRAVITY FILTERS

SOFTENER

FOR PARTICULARS ADDRESS
AMERICAN WATER SOFTENER CO.
LEHIGH AVE. AT 4TH ST.
PHILADELPHIA, PA.

FILTER



Sargent Dryers

Rapid, Thorough Uniform Drying

There are over two hundred mills that can vouch for our statement that SARGENT DRYERS live up to our claims for rapid, thorough, uniform drying, yet preserving the natural life and structure of the fibre and accomplishing these results at the lowest consumption of steam and power.

SARGENT DRYERS are backed by over 50 years of concentration in dryer manufacturing experience.

The SARGENT is designed on basic principles of air circulation, conveying and drying apparatus construction which has proven best from long experience.

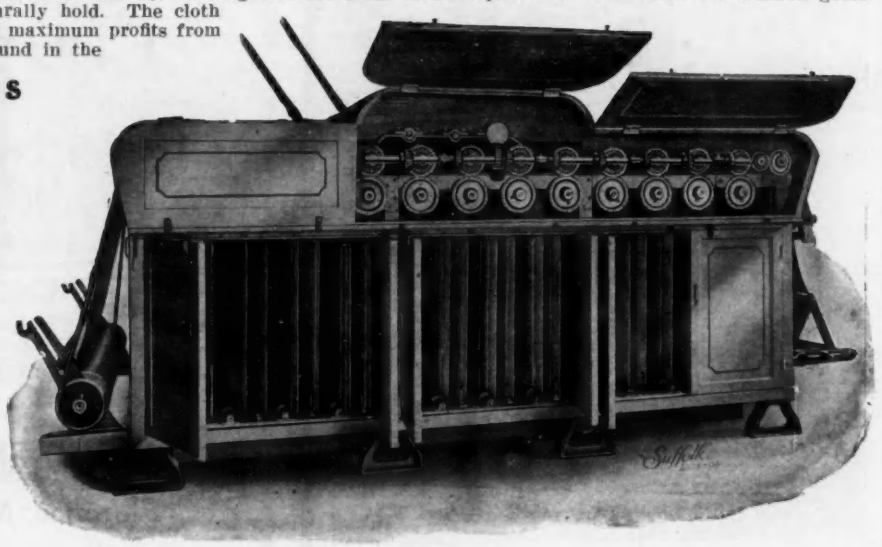
Write today and let us explain the principles of SARGENT DRYERS. Made in models for drying cotton, linters, wool, hair, flax and any raw material.

C. G. Sargent's Sons Corp.
Graniteville, Mass.
Fred H. White, Southern Agent
Charlotte, N. C.

Don't Throw Away 5% of Your Cloth

Of course you wouldn't throw away 5% of your cloth if you knew it, but probably you didn't know that ordinary methods of pressing removes more than 5% of weight in the form of atmospheric content which the finished goods should rightfully and naturally hold. The cloth regain process that insures maximum profits from your products has been found in the

Manufacturers Cooling and Conditioning Machine



which is a patented process, based on the operation of natural laws. It takes the dry, hot material as it leaves the dryer or press and restores the weight and dimension to the right amount that a good cloth should have. The fabric leaves the machine thoroughly cooled, minus static electricity which of course improves the handle, and there is imparted to it a rich softness entirely free from shadiness so often caused in uneven cooling. The finish is perfect and the color uniform.

The gain in weight alone is enough to pay for this machnie in a short while.

Write today for complete information.

MANUFACTURERS MACHINE COMPANY

Sales Department, 120 Milk St., Boston, Mass.
Factory: North Andover, Mass.

True Matching of Silk Hose and Cotton Upper Made Easy

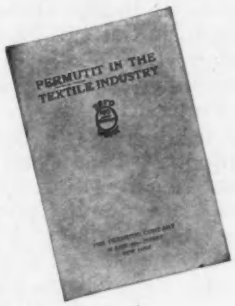
A mill of national reputation producing silk, cotton, woolen and mixed hose, experienced difficulty in their dyeing processes. In August, 1919, they installed Permutit Water Softening Equipment to remove all hardness from their water supply, and immediately noticed many manufacturing improvements.

One of their most difficult processes had been to match the color of silk hose with its mercerized cotton upper in one dye bath, but when soft water was used this difficulty disappeared. It was also found possible to match difficult shades at various times with the same formula, and in addition much time and labor from redyeing were saved.

Permutit is solving dyeing problems everywhere. All investigations are made free of charge. Write us today.

The Permutit Company
440 Fourth Ave. New York

Filters *Water Softeners* *Special Apparaus*

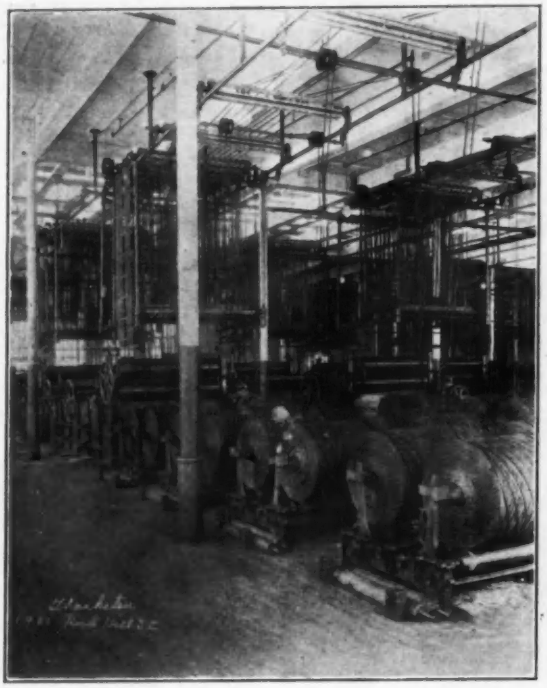


This booklet contains valuable information that every mill operator should have. Sent free, postpaid, upon request.

Zeolite Water Softener Patent Sustained

The Federal Court at Buffalo (Hazel, J) on June 15, 1921, handed down a decision sustaining our broad patent covering Zeolite Water Softeners. According to this decision all Zeolite Water Softeners on the market not made by us are an infringement of this patent.

No need to borrow trouble—Permutit is the best anyway.



Continuous System Indigo Dyeing Equipment for Warps

In the equipment illustrated fifteen warps are led through a Two Compartment Boiling Out and Cooling Machine, through two Indigo Vats, and taken up by Dye House Ballers in one operation in an initial run.

In a second run the fifteen warps are led through two Indigo Vats, and are taken up by Dye House Ballers.

In a third or finishing run, five of these warps are led through a Two Compartment Wash Box operating in connection with the Dry Cans equipped with a five-unit Coiler.

The successful handling of warps through Continuous Dyeing Sys'ems such as described is only possible through the use of Automatic Tension Controls and Regulators such as we build and use with our Dyeing Equipments.

For further particulars and prices, write or wire

Cocker Machine & Foundry Co.

Gastonia, N. C.

Builders of Warpers, Beamers, Warp Dyeing Machinery

WARPING MACHINERY

Linking Warpers—Linker Heads—Balling Warpers—Balling Attachments—Section Beam Warpers—Special Warpers.

WARP BEAMING MACHINERY

Long Chain Beamers—Short Chain Beamers—Warp Splitters—Special Beaming Machinery.

WARP DYEING MACHINERY

Boiling Out Boxes—Continuous Systems—Sizing Machines—Doubling and Splitting Systems—Sulphur Machines—Indigo Vats—Warp Coilers—Dye House Ballers—Hydro Sulphite Equipment—Warp Bleaching Equipment—Drying Cans.

NORWOOD

FILTERS

Will Deliver Clean Water
Gravity and Pressure Types
All Sizes to Suit Location and Conditions.

Write for Information.

NORWOOD ENGINEERING CO.

Florence, Mass., U. S. A.

CHAS. M. SETZER, Southern Representative,
Charlotte, N. C.

DURABLE K-W UNIVERSALLY USED

KLAUDER - WELDON DYEING - BLEACHING- SCOURING MACHINERY

There are K-W machines in use which were built nearly half a century ago and which are still doing their work efficiently and economically under severe service. This is sufficient evidence of the durability and capability of K-W Machines after long years of subjection to the ravages of live steam, heat and alkalis.

K-W Machinery by its accomplishments, has steadily and irresistibly built up a reputation that has made the name "Klauder-Weldon" synonymous with the **"world's best dyeing, bleaching and finishing machinery."**

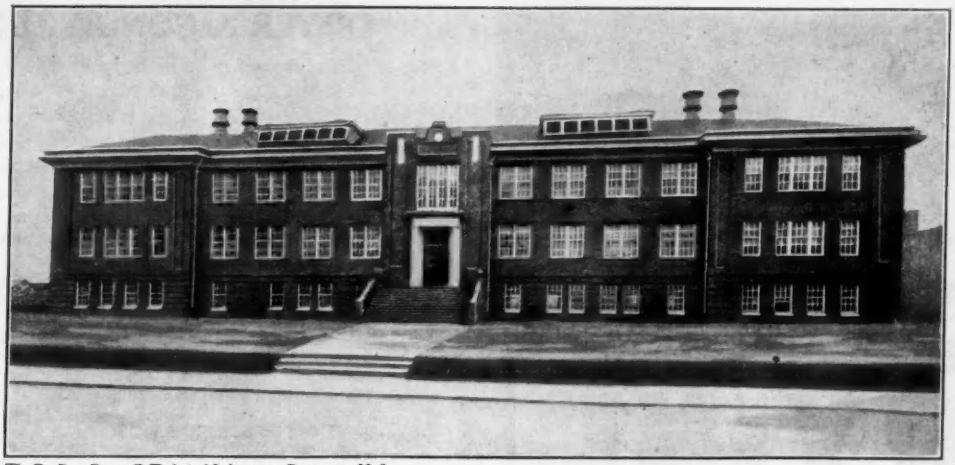
Our interest in upholding the K-W reputation means that you MUST be satisfied, and our suggestions to prospective purchasers are made with the view toward solving any dyeing, bleaching or scouring problem for all time. We will be glad to answer any and all questions without obligation on your part whatsoever.

Write today for K-W Literature

THE KLAUDER-WELDON DYEING MACHINE CO.

Bethayres, Pa., U. S. A.

H. G. Mayer, Southern Agent,
Realty Bldg., Charlotte, N. C.



The Du Pont Dyestuffs Technical Laboratory, Deepwater, N. J.
Here is a Laboratory for all the World of Dyestuffs Users

Two Fast Direct Dyes

Pontamine Light Yellow 5GX—

This dyestuff gives very pure shades, of a greenish cast. It is excellent for self-shades of lemon and canary yellows. Fastness to light and washing are two of its desirable qualities. It discharges to a pure white.

Pontamine Fast Black L—

Is a fast to light and washing dyestuff especially recommended for the dyeing of gray and slate shades on cotton or half-silk hose. It likewise finds a large use for padding sateens, lining and organdies.

Standard Textile Dyeing Machinery

In the commodious building illustrated above is maintained a Sales Service of unusual importance to the dye consuming trade.

Carefully trained chemists and demonstrators, with modernly equipped laboratories, including practical experimental dyeing equipment—provide means for the manufacturer who uses dyes to actually try out methods of application under practical conditions.

This Sales Service is rendering to the trade a very valuable help in determining the most advantageous method of application and the colors best suited for each individual requirement.

We will be glad to assist you in a solution of your dyeing problems.

E. I. du Pont de Nemours & Co., Inc.

Dyestuffs Department

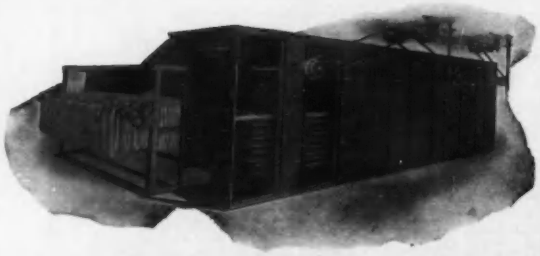
WILMINGTON, DELAWARE

Branch Offices

New York Boston Providence
Philadelphia Chicago
Charlotte, N. C.

DU PONT DYESTUFFS

"HURRICANE" DYEING, DRYING AND FINISHING MACHINERY, PRESSES, ETC.



AUTOMATIC
YARN DRYER & CONDITIONER

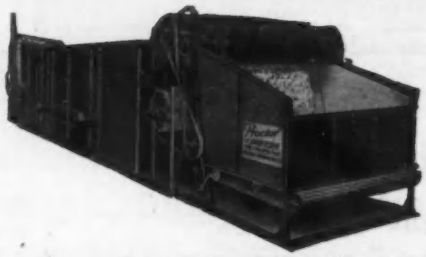
Every one who has seen this machine in operation has remarked on the softness and feel of the yarn.

Automatic temperature and humidity controls insure conditions in the machine best adapted to each particular material, preventing overdrying or baking.

Tests have proven that better steam economy is possible with this machine than with any other type.

THE PHILADELPHIA DRYING MACHINERY CO.
MAIN OFFICE AND WORKS: STOKLEY ST. ABOVE WESTMORELAND, PHILADELPHIA, PA.

DRYING



The "Proctor" Automatic Raw Stock Dryer—incomparable for drying dyed and bleached Cotton, Linters, Wool, or any other fibrous or loose material. Send for a catalogue.

PROCTOR & SCHWARTZ, INC.
formerly The Philadelphia Textile Mach'y Co.
PHILADELPHIA, PA.

"Proctor" DRYERS

FAST—permanent—not liable to fade, as a color. (Webster)

Fast Vat Dyes That Are Fast

——for Calico Printing
——for Cotton Dyeing
——for Silk Printing and Dyeing

are available for prompt shipment in

Blue, Red, Scarlet, Bordeaux
Violet, Orange, Green,
Olive and Yellow Shades

Laboratory Service

A. KLIPSTEIN & CO.
644 Greenwich St.
NEW YORK CITY

Where the Buyer Benefits

How More Favorable Buying Conditions are Being Created by Advertising in This Paper at This Time.

Through regular advertising, sellers are making buying opportunities, instantly available. By publicly committing themselves in their advertising, they are giving you a strong assurance of faithful performance.

Advertisers are cutting sales costs through the use of advertising as a SALES MACHINE just as they reduce production costs by improved machinery methods.

This means ability to make LOWER PRICES to you.

Advertising in a buyer's own paper caters to his convenience; it saves the buyer's time; it helps the buyer weigh and balance rival claims; when the salesman calls, it saves the time of both buyer and salesman by providing the foundation for intelligent judgment.

The seller who is building reputation through advertising will jealously guard that reputation in every transaction, beginning with the merit of the merchandise.

Advertising indicates progressiveness, not alone in selling, but throughout the entire business.

By advertising, the seller is publicly displaying his ability and desire to serve you, instead of silently relying upon the necessity of the buyer to produce orders.

Maintaining Uniform High Quality

The reason that Mathieson Chemicals are recognized the highest standard of quality is that each step in their manufacture, from the raw material to the finished product, is under the constant observation of chemical engineers and each step is tested carefully for purity and uniformity.

You will never make a mistake when specifying Mathieson in ordering any of the following:

LIQUID CHLORINE: 100% Pure Anhydrous, shipped in 105, 150 and 2,000 pound containers. Used in practically every bleaching operation where bleaching powder is used.

BLEACHING POWDER: The highest test and most stable bleach manufactured. Shipped in 225 lb., 300 lb., 450 lb., and 750 lb. steel drums. Special drums for export; wooden lined, containing 400 lbs.

SODA ASH. 58% Pure Alkali, both light and dense. Shipments in bulk, bags and barrels.

CAUSTIC SODA: 60, 70, 74 76% Fused—Ground—Flaked. 78% Solid—99½% Pure—Castner Electrolytic Process. Shipments of Solid in steel drums; Ground and Flaked in barrels and drums.

VIRGINIA SODA: (Sesquicarbonate of Soda) A beautiful white crystalline neutral soda, uniform in character and action. The finest neutral textile soda for scouring and washing. Shipment in barrels and bags.

BICARBONATE OF SODA: Purest grade, powdered or granular. Shipments in bags, barrels, kegs and cases.

CHLORINE SOLVENTS: Tetrachlorethane Ethylene, Chloride and others.

If you have a problem to solve, our Technical Service Department is at your service without obligation.

Shipments made from centrally located stocks located in different parts of the South. Write, wire or phone our Southern office at Charlotte. Demonstrator gladly sent to your mill on request.

THE MATHIESON ALKALI WORKS, (Inc.)
Executive Offices: 25 West 43rd St., New York City

Mathieson Chemicals

EAGLE-THISTLE BRAND

Southern Sales Office:
Commercial National Bank Bldg.,
Charlotte, N. C.
Works:
Saltville, Va., and
Niagara Falls, N. Y.

Branch Offices:
327 LaSalle St., Chicago, Ill.
911 Hospital Trust Bldg.,
Providence, R. I.
525 Widener Bldg.,
Philadelphia, Pa.

CIBA COMPANY, INC.

CEDAR AND WASHINGTON STREETS, NEW YORK

Sole representatives in the United States of the

SOCIETY OF CHEMICAL INDUSTRY IN BASLE, SWITZERLAND

Special attention is called to the

DOW'S SYNTHETIC INDIGO 20% PASTE

Premier American Made Indigo

Fully equal to any foreign product ever manufactured.

SELLING AGENTS FOR

CINCINNATI CHEMICAL WORKS, INC., NORWOOD, OHIO

BRANCHES:

BOSTON PROVIDENCE PHILADELPHIA CHICAGO COLUMBUS, GA

Stauss 68% Soluble Tallow and Gum—Soluble Oils

for all warp sizing and finishing purposes.

None better.

Manufactured by Geo. P. Stauss.

Importers and Distributors of

Starches, Softeners, Weighting Compounds

Write, phone or wire

Southern Distributing Company

Manuel Faulkner, Sales Mgr.

50 Market St., Phone 3439 Charleston, S. C.

YOUR DESIRE

Your desire to supply clean, sanitary laundry work caused you to install a community laundry of your own. Maybe your work is costing you too much, or maybe it is not as clean, as soft, and as sanitary as you wish it was.

Community laundries are rapidly turning to the use of

"Wyandotte" Yellow Hoop

for in it they find a safe, sure, sanitary detergent that does give the required results, and does it too at a surprisingly low cost.

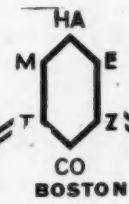
This trade mark card

in every package.

If you believe you are entitled to better results, write us for particulars about the use of this unusual and widely known laundry soda.

THE J. B. FORD CO., Sole Mnfrs.,

Wyandotte, Mich.



PRESIDENT HARDING SAYS:

"WE WANT less Government in business and more business in Government."

The dyestuff schedule in the proposed tariff bill with its licensee and embargo features is "Government in Business" with a vengeance.

As a consumer of dyes, the question of licensing imports affects you materially.

It is up to the consumer to decide for himself.

Now is the time to make your position clear to your Representatives and Senators.

Aside from the line of Dyestuffs, Intermediates, Cotton Finishes, Turkey Red Oils, Soluble Oils and Leather Oils made in the U. S. by

CONSOLIDATED COLOR & CHEMICAL CO.

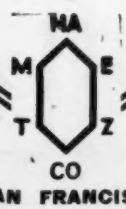
and

CENTRAL DYESTUFF & CHEMICAL CO.

we can also procure for you vat and other colors on licenses at lowest prices quoted for export by the European manufacturers.

A new color card of American made colors on cotton yarn is being distributed. Have you received your copy?

H. A. METZ & CO. Inc.
One-Twenty-Two Hudson Street, New York City.
Boston Philadelphia Providence
Chicago Charlotte San Francisco



"DEVELOPENE"

Leaves No Argument as to When

"BLACK IS BLACK"

WHY BE SATISFIED

with a RUSTY BLACK when you can have a RICH LUSTROUS BLACK by finishing your Hosiery with the latest, most efficient and satisfying patented preparation

"DEVELOPENE"

A Demonstration Will Convince You

Send us a pair of unfinished stockings, skein of yarn or a piece of fabric—cotton, silk, artificial silk, wool or mixes—which has been dyed black, washed but not finished. We will finish it with "DEVELOPENE" and return to you.

There will be such an improvement that you will immediately want "DEVELOPENE" for finishing your goods.

No further softener—or soap—required. Makes hosiery slip on and off the board easily—leaves the product soft and pliable.

Manufactured Only by the

KALI MFG. CO.

1404-1410 North Front St.

PHILADELPHIA, PA.

Sole Manufacturers of

Hydroxy Oil and Sodium Sulphide{ Single and Double Strength Kali Chlorine Neutralizer

Established 1815

ARNOLD HOFFMAN & CO., Inc.

Providence New York Boston Philadelphia Charlotte

Oldest in Years. Youngest in Spirit

Modern in Ideas. Progressive in Methods

"Service" Our Motto

All kinds of Warp Dressings, Finishing Materials, Soaps, Soluble Oils, Etc.

Please Submit Your Problems to Us

TEXTILE

STARCHES

THIN BOILING

WHITE OAK

ECLIPSE

RADIO

These Three Brands comprise all fluidity grades of Thin Boiling Starch.

Through cooperation, we can "fit" the fluidity grade to the Mill Superintendent's actual Starch requirements in Textile Construction and Finish.

Always—Uniform Pure and Clean

A. E. STALEY MFG. CO.

DECATUR, ILLINOIS

ZAVON

The Super Solvent

Will increase your business by improving the quality of goods produced in your mill. ZAVON excels all other solvents BECAUSE:

1st. It creates an affinity for the dye thus producing even, rich effects.

2nd. It replaces soap in the kier, affecting a marked saving in operating costs.

3rd. It removes all stains from knit goods and hosiery.

4th. It greatly reduces the amount of "seconds" in hosiery mills.

ZAVON will be found to be a superior softener for penetration.

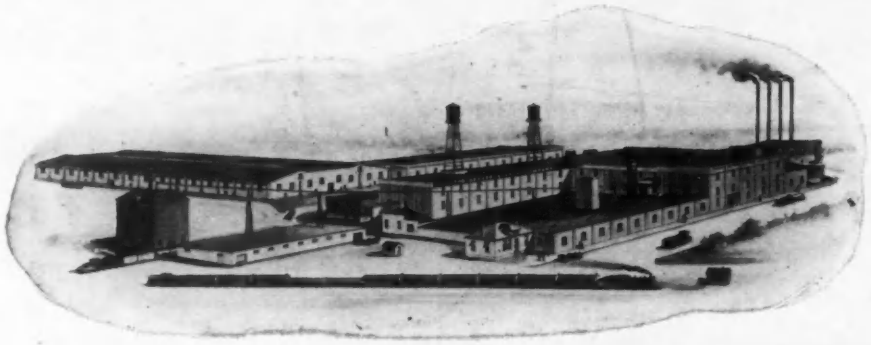
For mills using silk and cotton mixture ZAVON can be used both as a softening and cleaning agent.

We are in a position to handle all orders promptly and are always pleased to send working samples upon request.

ZAVON COMPANY

INCORPORATED

Bush Terminal, Bldg., No. 1 ***Brooklyn, N. Y.***



VICTOR MILL STARCH

The Weaver's Friend

It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.

A trial order will convince you that VICTOR STARCH has no equal on the market.

THE KEEVER STARCH COMPANY, Columbus, Ohio

Southern Agent: MR. JAMES H. MAXWELL, Greenville, S. C.

If you are not already using VICTOR STARCH call on our representative for a demonstration at your convenience.

The Grasselli Chemical Co.

"DYESTUFF DEPARTMENT"

WORKS AT:

Grasselli, N. J. Albany, N. Y.

COLORS FOR ALL PURPOSES

CHEMICALS AND ACIDS

ZINC DUST

"BRETON" MINEROL "F"

For

Plushes and Velvets

"It gives a clothy hand."

BORNE, SCRYMSER CO.

Established 1874

80 South Street, NEW YORK

BOSTON PHILADELPHIA

Works: Elizabethport, N. J.

Starch

EAGLE ★★★
EAGLE ★★
EAGLE ★
EAGLE ★★★★

The experience of critical operators has shown this popular brand to be the most efficient sizing agent, both for additional WEIGHT and increased STRENGTH of WARP. Penetration accomplishes these important results.

EAGLE STARCH is specially manufactured to cover a wide range of fluidities to meet the needs of all classes of weaves.

EAGLE STARCH penetrates.

Corn Products Refining Co.

New York

Southern Office *Greenville, S. C.*

Starch

American Yarn and Processing Company

MOUNT HOLLY, N.C.

Successors to

AMERICAN PROCESSING CO.
ADRIAN MANUFACTURING CO.
ALSACE MANUFACTURING CO.
NIMS MANUFACTURING CO.
UNION COTTON MILLS
WOODLAWN MANUFACTURING CO.

Spinners and Mercerizers of

HIGH GRADE COMBED AND CARDED YARN

16s to 80s SINGLE AND PLY

WARPS, SKEINS, TUBES AND CONES

MERCERIZING
BLEACHING
GASSING

IN A NEW AND STRICTLY MODERN PLANT

HIGHEST QUALITY PROCESSED YARN

We are located in the center of the combed yarn spinning industry of the South and are enabled to furnish you with highest quality processed yarns in all numbers.

NEW YORK REPRESENTATIVE:
H. B. ROBIE, 346 Broadway.

PHILADELPHIA REPRESENTATIVE:
FORREST BROS., Forrest Bldg.

JACQUES WOLF & CO.

Manufacturing Chemists and Importers

PASSAIC, N. J.

ALL SIZING and FINISHING PRODUCTS for COTTON

CREAM SOFTENERS

HYDROSULPHITE

For stripping and discharge printing.

BLEACHING OIL

Kier boil assistant.

SOLUBLE OILS

MONOPOLE OIL

Reg. Trade Mark No. 70991.

Visit Booths No. 828-830-832
Seventh National Chemical Exposition
8th Coast Artillery Armory,
New York—Sept. 12-17.

B. & L.

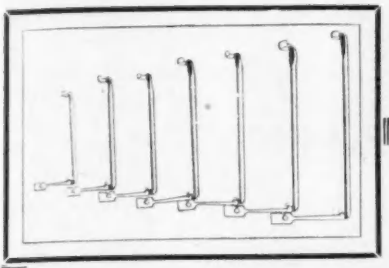
Anti-Chlorine Bleaching Process

FOR COTTON

Simple
Scientific
Safe

BOSSON & LANE

Works and Office, Atlantic, Mass.



The Souths' Only Flyer Presser Makers

Manufacturers of
Steel Rolls, Pressers, Card Room Spindles, Whirls, Spindle Steps, Lifting Rods, Collars, Bushings, Top Rolls, etc.

Overhaulers of
Fly Frames, Spinning Frames, Twisters and Spooners.

Expert Repairers of
Steel Rolls, Spindles and Flyers, Picker Lap Pins, Cylinder Heads, Doffer Comb Bars, etc.

We Sell
Twisters, Single or Double Spinning Rings of the Best Make.

Our Method of Aligning and Leveling Shafting by the Kinkead System is Recognized as the Best.

We Do Electric and Acetylene Welding which we Guarantee.

Southern Spindle & Flyer Co.
CHARLOTTE, N. C.
Manufacturers, Overhaulers and Repairers of Cotton Mill Machinery
W. H. Monty, Pres. & Treas.
W. H. Hutchins, V.-Pres. & Sec.

BUBBLING FOUNTAINS
Ice and Water Cooled
INVESTIGATE THE NEW IDEA

This is one of many Types.
—
Last word in Ice-Cooled Fountains
—
TWO TANKS —Ice in one and waste cold water from Bubbler in the other

Our Lines Cover:

Sanitary Wash Bowls (in batteries), Bubbling Fountains (plain and ice cooled), Metal Lockers, Metal Stock and Pattern Storage Racks, Metal Shelving, Metal Cabinets, Vault Fixtures, Soda Kettles (40 and 60 gallons), Metal Stools and Chairs, Water Mixers, Work Benches, Bench Legs, Full Line of Plumbing Fixtures, etc.

Send for Complete Catalog.

Manufacturing Equipment & Engineering Co.
136 FEDERAL STREET, BOSTON, MASS.
Works and Mail Address: Framingham, Mass.

Why Bleach Cotton Goods ?

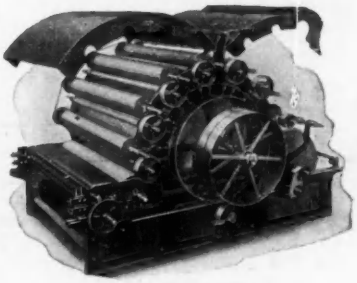
SURPASS CHEMICAL CO. INC. — AUTOGYP PROCESS OF DYEING — AUTOGYP — ALBANY, N.Y.

when you can eliminate this process, by using the Auto-Gyp process of dyeing? Heretofore ordinary dyeing methods required at least SEVEN operations whereas the AUTO-GYP process necessitates only ONE operation. Write today for full details, and let us show you what you can save on finishing your goods.

SURPASS CHEMICAL COMPANY, ALBANY, N. Y.

AUTO GYP
Process of Dyeing

Smith & Furbush
Machine Company
Philadelphia



Cotton Waste Card.

Card shown above has been recently designed. It is especially adapted for the making of Absorbent Cotton, Wadding, Batts, or Felts of the better grade, etc. Similar cards in sets are used for Cotton Waste Yarns spun on the woolen principle. Ask for circular S-165.

Specialists in all kinds of Waste Machinery.

FIG 50

Lane Doffing Trucks are made to wear. Heavy Duck and spring steel frame permit rough handling. Light weight, easy running. Mounted on our improved non-clogging Thread-guard Casters, either stationary or swivel.

LANE

Canvas Baskets and Trucks

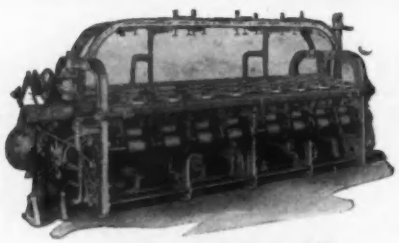
A Style for Every Department

FIG 20

Lane Canvas Mill Boxes are free from all roughness, thus reducing waste. Rim bound with tough leather. Shoes of hard maple, renewable.

Standard American Equipment

W. T. LANE & BROTHERS, Manufacturers Poughkeepsie, N. Y.



Fletcher Heavy Webbing Looms

are the Standard for Weaving Solid Woven Belts

Never was the time more opportune to survey your weaving machinery equipment and tune it up for high pitch production at the lowest possible cost.

The time for economical production is here. There is no machinery investment you can make which yields so great a return—dollar for dollar—as FLETCHER Looms.

FLETCHER WORKS

Formerly Schaum & Uhlinger
Glenwood Ave. at Second St.,
Philadelphia, U. S. A.

TEN YEARS or more with the same loom-harness when you weave with

"DUPLEX" FLAT STEEL LOOM HARNESS

Let us quote you

STEEL HEDDLE MFG. CO.

GREENVILLE PHILADELPHIA PROVIDENCE

Southern Office

111 Washington St. Greenville, S. C.
Hampton Smith, Southern Manager.

Labor Lessened is Money Saved

Quick, easy transportation in and about your plant is a vital item. Excess time or labor means expense. Save it.

Diamond Fibre Receptacles are systematic savers of lost motion. They pay big dividends—far in excess of their cost. They last for years and continue to pay because they are made of non-splintering non-rusting, practically indestructible Diamond Fibre. We make a full line of these hardy receptacles; trucks, doffing cars, roving cans, waste baskets, barrels, sample cases and many other things.

Write today for literature and let us show you our latest models.

Diamond·F

Dept. 8

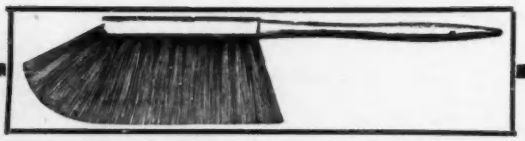
Diamond State Fibre Company

Bridgeport (near Philadelphia), Penna.

Branch Factory and Warehouse: Chicago

Offices in Principal Cities

In Canada: Diamond State Fibre Co. of Canada, Ltd., Toronto



A Brush for Every Purpose

Loom Dusters, Comber Dusters, Bench Dusters, Pulley Dusters, Rail Brushes, Clearer Brushes, Reed Brushes.

Roller Brushes, Guide Brushes, Humidifier Brushes, Floor Brushes, Push Brushes, Finger Brushes, Flat Top Card Brushes, Burr Picker Lags, Thread Dress Lags.

Machine Roll Brushes and Doctor Brushes for Calico Printers.

Tenter Brushes, Scavenger Brushes, Belt Brushes, Card Grinder Brushes, Comber Cylinder Brushes.

THESE BRUSHES CARRY THE TRADE MARK OF QUALITY

FELCO

Which Insures You Getting the BEST BRUSH on the Market

We Operate a High Efficiency Repair Department

CAN WE SERVE YOU?

Atlanta Brush Company

Successors to D. D. Felton Brush Co.

Central & Trinity Aves. Atlanta, Ga.

SPINNING RING SPECIALISTS SINCE 1873

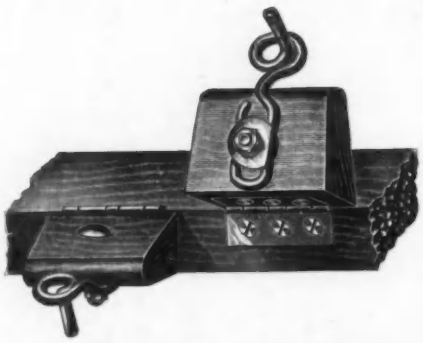
SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH

TRAVELLER CLEANERS
TRAVELLER CUPS
GUIDE WIRE SETS

WHITINSVILLE
SPINNING RING CO.
WHITINSVILLE, MASS.

The Palmer Adjustible Thread Guide



For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

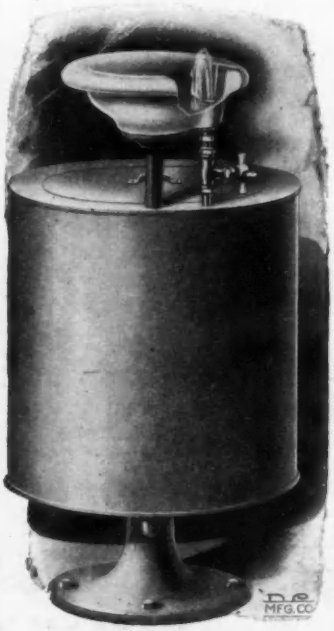
Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

SUMMER SLUGGISHNESS



Employees are becoming sluggish during these dry, hot, scorching days and it will certainly show up on your production chart unless you endeavor to check these effects of summer upon your labor.

Cool bubbling drinks of pure, refreshing water is just the thing to put your employees to top-notch efficiency during these hot months. Besides the perfect cooling arrangement of the

Rundle-Spence "Vertico-Slant" Fountain

is the science-proven sanitary method in which the water is dispensed. The vertico-slant founta'n prevents contamination from the water fal ing back, as is the case in a vertical fountain.

Lips cannot touch the nozzle.

Write for attractive catalog.

Rundle-Spence Mfg. Co.

MILWAUKEE, WIS.

Shambow Shuttles

RE-INFORCED with Red Vulcanized Fibre will outwear the best plain wooden Shuttle two in one and increase loom production and maintain, if not actually improve, quality. They will prevent an end an hour per loom from going down. Figure this out in additional loom hours added to your present producing capacity.

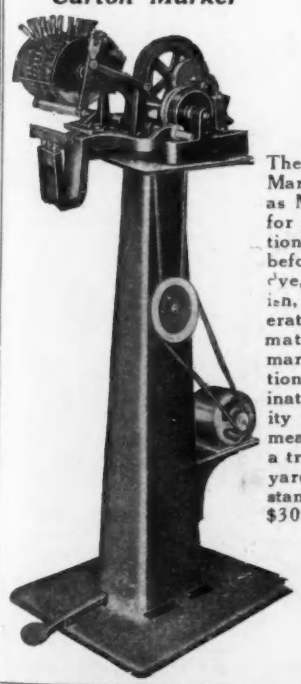
We are Southern Distributors for the SHAMBOW SHUTTLE CO., of Woonsocket, R. I., and maintain in Atlanta a complete Service and Advisory Department, in charge of Mr. A. W. Angell, a direct Factory Representative, whose entire time is at the disposal of the Southern Textile Mills, to help reduce your Shuttle troubles to a minimum. Let us explain to you the advantages of using Shambow Fibre Re-inforced Shuttles and Picker Sticks.

The **WALRAVEN** *Co.*

Machinery and Mill Supplies. ATLANTA, GA.

SPECIALISTS IN MARKING MACHINES

Carton Marker



The Carton Marker is for printing the size, descriptive names or colors, style numbers, or lot numbers, on the carton or the label, giving an absolute uniform result on all your containers; eliminating the poor and blurry mark that is usually obtained by the use of hand stamps.

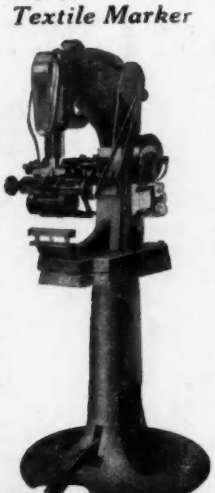
Over 500 of these equipments are in operation.

Is adapted for marking the set-up, folding or telescopic carton.

Price of standard equipment, $300.

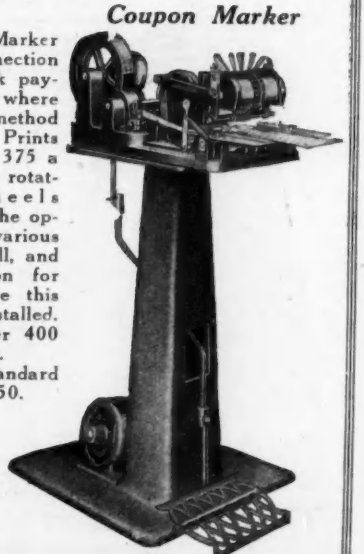
Textile Marker

The Standard Textile Marker, designated as M-5 equipment, is for placing identification marks on pieces before going into the dye, bleach and finish, or any other operation in which the material requires marks for identification purposes, eliminating any possibility of error or short measure. Gives you a true check on your yardage. Price for standard equipment $300.



Coupon Marker

The Coupon Marker used in connection with piecework payroll systems, where the coupon method is operated. Prints at the rate of 375 a minute. Has rotating type wheels which enable the operator to set various numbers at will, and is the solution for marking where this system is installed. There are over 400 of these in use. Price of standard equipment, $250.



MARKEM MACHINE CO.

232 Summer St., BOSTON, MASS.

Maintain The Summer Efficiency of Workmen by Cool, Pure Water

Bottled water and paper cups run into a lot of money but here's how you save all this and get the best results

Twentieth Century Sanitary Ice-Cooled Bubbling Fountains

are for attachment to city water supply and they supply ice-cooled water which is much more sanitary than "ice-water."

They hold 75 pounds of ice—will supply 50 to 75 people. Self-cleaning, do not harbor germs, use less ice than ordinary water coolers—are durable in construction and attractive in looks.

Our Bubbler Heads are absolutely non-squirting and give forth a steady, easily-regulated stream.

Send for complete catalog and prices.

Twentieth Century Brass Works
Belleville, Ill.

Drinking water in winter is as necessary as in summer time, But it must be dispensed in a sanitary manner.

A PURO Cooler with its PURO, JR. Fountain will keep your employees both healthy and happy.

Start a campaign now and clean out the "old tin drinking cup."

Install a PURO Cooler and thereby increase the productiveness of your employees.

PURO SANITARY DRINKING FOUNTAIN CO.
HAYDENVILLE, MASS.
E. S. PLAYER, Southern Sales Mgr.,
Masonic Bldg., Greenville, S. C.

THE "Southwestern Iron Clad"
Is the IDEAL Cotton Mill Broom

Only the best grade of broom corn is used in these brooms—they are built strong and will withstand the hardest usage.

The light weight, yet strong and substantial shields used gives the broom ample protection and at the same time allows the proper amount of of broom corn to be used, thus giving them excellent sweeping qualities.

MADE RIGHT!
PRICED RIGHT!

Inquiries and orders receive prompt attention.
Sold direct and through
all principal distributors.

The Southwestern Broom Mfg. Co.
Evansville, Indiana

FIBRE BRUSH FOR SWEEPING

A Clean Mill To Work In

Means contented workmen, and contented workmen means better work and more of it. Coincident with the wave of receding wages that is sweeping over the land far-seeing employers are taking heed of the little things that go far toward making their employees contented and not the least of these is to keep the working place clean and inviting.

The "Two-in-One" Combination Sweep and Scrubbing Brush fits into the new requirements of the times because it is made to lessen toil and do effective work at the same time. Its use in any mill or workshop means absolute cleanliness, a big saving in labor cost, and minimum outlay in replacement. Write for catalogue and price list of brooms and brushes of all kinds.

SOUTHERN BRUSH AND BROOM COMPANY,
601 Citizens & Southern Bank Bldg., Atlanta, Ga.

A Comparison of Drinking Fountain Streams

Vertical Stream Bubbler Condemned Everywhere — Camouflaged Vertical Stream — Rainbow stream. Hose-like. difficult to drink from.

No. 1 shows the vertical stream which permits saliva and waste water from the drinker's mouth to fall back to the source of supply. No longer considered sanitary.

No. 2. is a slight modification of vertical stream type. This slight angle is little if any improvement over No. 1.

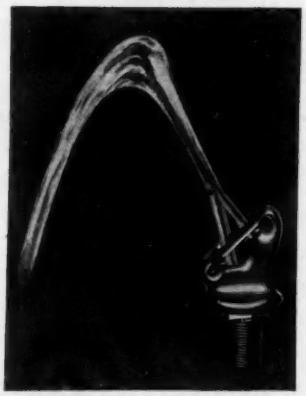
No. 3 is more sanitary if properly used. But stream is hose-like with no definite drinking point. Drinker places mouth as near water outlet as possible. Unsanitary like Nos. 1 and 2.

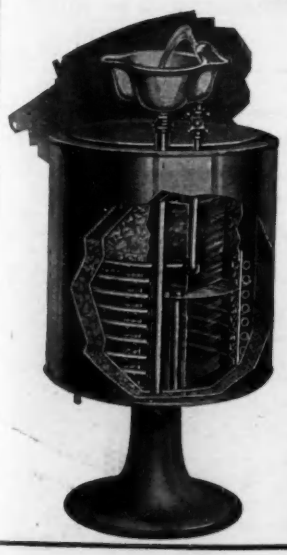
The Puritan Cantonment "Mound Building" Stream

Practical drinking mound is formed by mechanical means. Interference is set up in stream which retards water movement at the apex of arc. This stream makes it impractical to drink from any other point.

Approved by U.S. Government. Now recognized by largest interests and schools in the country.

—Definite Drinking Point.
—Sanitary and Practical.





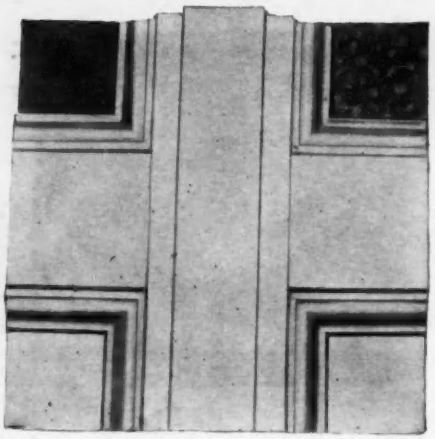
Puritan CANTONMENT DRINKING FOUNTAINS

Puritan "Cantonment" Coolers are designed to connect to pressure lines and are so constructed that the drinking water does not come in direct contact with either the ice or ice water, but is circulated through brass coil which is tinned both inside and outside.

With 2-stream "Mound Building" Projector this cooler is the most efficient and sanitary of its kind on the market.

WRITE FOR ILLUSTRATED LITERATURE NOW.

Halsey W. Taylor Company
Warren, :: :: :: Ohio



Unretouched photograph of a corner detail of a SANYMETAL office partition, finished light gray, showing two kinds of glass used, Notice the clean-cut workmanship.

Made by Metal Craftsmen

ALL the deliberate care and skill of the old cabinet makers go into the building of SANYMETAL partitions. The men who make them are craftsmen in metal, taught to work well before they work swiftly. And yet they make SANYMETAL to cost but little more than ordinary partitions.

Sanymetal
TRADE MARK U. S. REG.

corners and mitres, acetylene welded, are so neatly done that when enameled the joint is invisible. Not a spot weld shows; not a bolt or screw is in sight. The drawn steel molding is pressed on and held by a concealed locking device. Glass is not puttied in—steel stops secure it rigidly.

These are a few of the perfected details that make SANYMETAL the superior partition for office, mill, warehouse and plant hospital; office railings and counters, toilets, showers, screens, telephone booths, metal doors, etc. Catalog on request.

THE Sanymetal PRODUCTS COMPANY
TRADE MARK U. S. REG.
980 East 64th Street - Cleveland, Ohio.

SIGNODE SIGNODE SIGNODE

MILLIONS OF BALES

Tied the SIGNODE WAY

Reached Destination in Perfect Condition

The greater strength of SIGNODE TIES together with the use of SIGNODE TIE FASTENERS makes REBOUND impossible. No jagged tie ends to tear the hands.

Saves time, labor and material cost

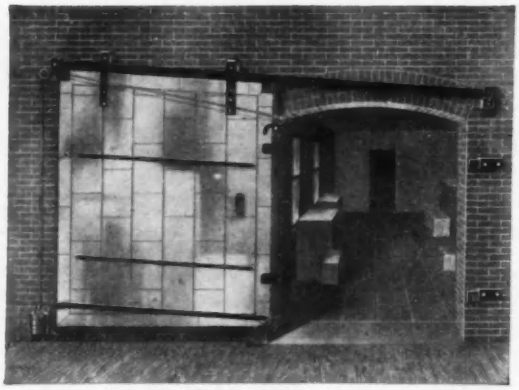
Illustration shows a few of the half-million bales, Signode-strapped, that have passed through one shipping room. Branch offices and warehouses throughout the country insure quick service wherever you are.

Write us for details.

SIGNODE SYSTEM, INCORPORATED

570 W. Adams St., Chicago

Stop the fire fiend - -



It is more than likely that every factory, warehouse, or plant, devoted to business purposes is protected by fire insurance. This insurance covers loss of property only. This loss is, in the majority of cases only a very small percentage of the actual loss which results. The big loss is that of production.

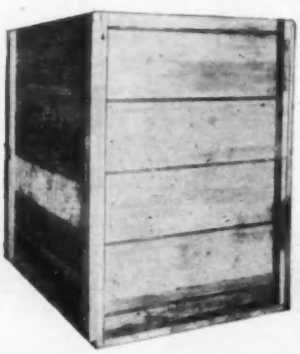
Richards-Wilcox fire doors, automatically operated by fusible plug control, whenever fire breaks out, will isolate the room in which the fire starts. Protect your plant against the possibility of a big loss by promptly installing R-W fire doors.

Write today for our Latest Catalog G-16

Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides

CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA — AURORA, ILLINOIS, U.S.A. — BOSTON NEW YORK MINNEAPOLIS SAN FRANCISCO — CLEVELAND — INDIANAPOLIS — LONDON, ONT.



Cypress Tanks
Wooden Packing Cases
ALL STYLES

Manufactured from

GEORGIA PINE POPLAR CYPRESS

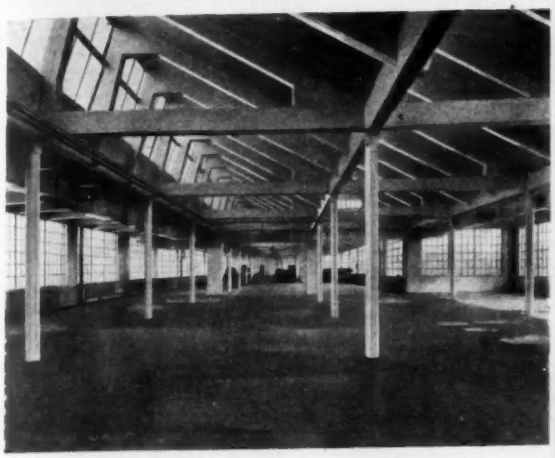
WHITE PINE and GUM

Your Inquiry Solicited

Hightower Box & Tank Co.

Corner Humphreys and Glenn Streets,

BOX 1025 ATLANTA, GA.



Top floor showing concrete saw tooth roof. Concrete columns only nine inches octagonal. Stewart Silk Company mill at Easton, Pa.

Essentially a Textile Building

Thompson & Binger's contribution to this new mill was more than engineering and construction skill. We contributed practical textile experience to the design which makes this building essentially a textile mill.

Incidentally, this building was designed and constructed on a single contract, on the cost-plus basis, and delivered to its owner for **less than estimated cost.**

5 At present we are constructing buildings in five states.

THOMPSON & BINGER
INC.
ENGINEERS & CONTRACTORS
CONSULTATION - DESIGN - CONSTRUCTION

NEW YORK
280 MADISON AVE.

SYRACUSE
GURNEY BUILDING

CONCRETE

EVENER LAPS MAKE EVENER WORK

The bearing friction of apron and evener rolls causes the evener belt to slip. This makes a thin place in the lap.

Put ball bearings on the evener and apron rolls and eliminate the friction that causes belts to slip, and you will get a much more uniform lap.

The installation is simple, and the cost slight.

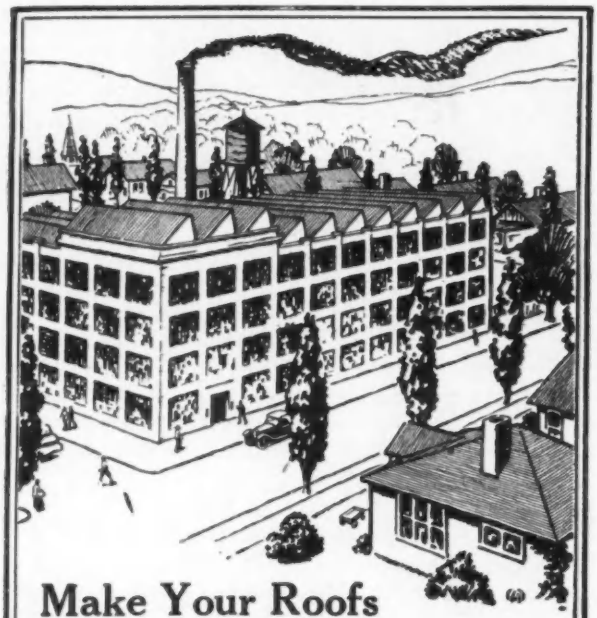
AldricH MachinE
Ball WorkS Bearings
Greenwood, S. C.

Painting

LET us furnish estimates on your painting. We can refer you to scores of big mills throughout the United States that we have painted.

Write or phone us today.

H. NEWTON MARSHALL CO.
CONTRACTING PAINTERS
ATLANTA, GA. BOSTON, MASS.
D. R. Hall, Southern Manag
501 Trust Co. of Ga. Building, Atlanta, Ga.



Make Your Roofs Last Years Longer

Bay State Roofing Stain is a beautifier and preservative for all asphalt shingle and composition roofs.

It prevents peeling and scaling. It acts as a powerful binder for those prepared roofings that have rough surfaces—disintegration or the rattling off of loose particles is impossible where Bay State is used.

It prevents the dullness of weathering, and will stand up under the hottest sun, the hardest rains, and the most exacting conditions. Bay State Roofing Stain has passed the severest possible tests with honors.

And in addition to adding years of life to a roof, Bay State makes it beautiful to look at. This perfect stain comes in dark red and dark green. Write for complete information and booklet entitled "Bay State Roofing Stain".

Brighten the interior of your mill, factory or warehouse with DIXIELITE, the perfect white finish for walls and ceilings.

WADSWORTH, HOWLAND & CO., Inc.
Paint and Varnish Makers
Boston, Mass.

New York Office
Architects Bldg.

Philadelphia Office
1524 Chestnut Street

BAY STATE
Roofing Stain

Your plant is worth --?

THERE is a potent reason for the many plant appraisals that have been made recently.

The present commercial era is one of change and uncertainty. Tumbling prices, difficult wage adjustments, unstable markets, these and other infirmities obscure the true condition of industry. And it is proportionately difficult to determine the present worth and future possibilities of the individual plant.

Appraisals made but a few years ago are misleading now—they will be more so in the near future. An appraisal made today should include not only an accurate valuation of buildings, machinery and equipment, but also a dependable estimate of the development of the plant and the industry at large.

The industrial valuation service of Lockwood, Greene & Co., combining the opinion of experienced engineers and owners of industrial plants, is especially adapted to the present peculiar business conditions. It considers such important questions as labor and transportation conditions, present and future value of patents, a study of processes and marketing capacity and the value of the component parts of the plant for their intended purpose.

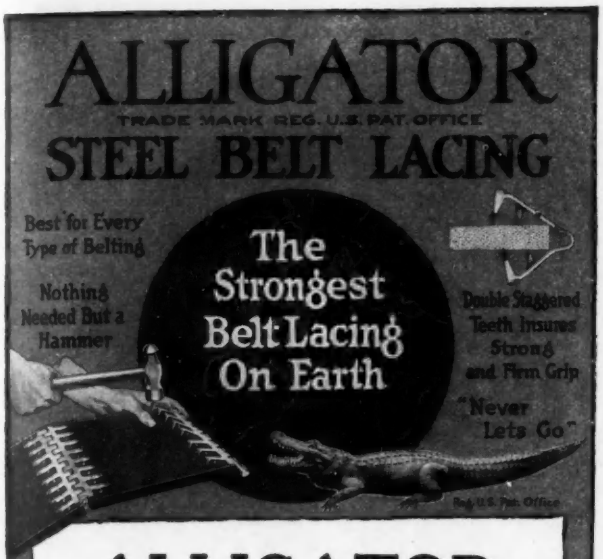
This comprehensive, dependable service is available to every manufacturer, regardless of location, for each of our offices has facilities to make a thorough valuation of your plant.

BUILDING WITH FORESIGHT

LOCKWOOD, GREENE & CO.
ENGINEERS

EXECUTIVE OFFICE, 60 Federal Street, BOSTON

BOSTON ATLANTA CHICAGO NEW YORK
DETROIT CLEVELAND CHARLOTTE PHILADELPHIA
SANTIAGO, CHILE
LOCKWOOD, GREENE & CO. OF CANADA, LIMITED, MONTREAL
COMPAGNIE LOCKWOOD GREENE, PARIS, FRANCE


ALLIGATOR
TRADE MARK REG. U.S. PAT. OFFICE
STEEL BELT LACING
Best for Every Type of Belting
Nothing Needed But a Hammer
The Strongest Belt Lacing On Earth
Double Staggered Teeth Insures Strong and Firm Grip
"Never Lets Go"
Reg. U.S. Pat. Office

ALLIGATOR

Increases Production Efficiency By Minimizing Belting Troubles

Compare your present lacing, point by point, with these features of ALLIGATOR Steel Belt Lacing.

"ALLIGATOR" is easiest to apply. Requires no tool but a hammer and only three minutes average time. Anyone can put it on.

Makes a permanent hinged joint that can be run on both sides, and works equally well on any size of power or conveyor belting.

The staggered teeth (see illustration) penetrate lengthwise through the belt and clinch on both sides, leaving the burden-carrying fibers intact without weakening them. The sectional rocker hinge pin is serviceable under all conditions.

Because of these reasons—ease and facility of application, long life in operation, belt-saving characteristics and economical features—ALLIGATOR is chosen in every industry all over the world. The decision of hundreds of thousands of belting users should influence you.

Try it! If you are not using ALLIGATOR Steel Belt Lacing, ask your preferred belting house or dealer for it or write for samples and prices.

FLEXCO-LOK
Reg. U. S. Pat. Office
Steel LAMP GUARDS

A mechanically perfect guard—sold at a decided saving to a purchaser. All sizes, with or without reflectors, for standard brass or weather-proof sockets. Either portable or stationary types, with patent self-retaining lock screw or plain round head screw. Write for information and prices. Not stocked in London.

Get Our Free Belt Book

This book will tell you many things about belts and belt lacings that you should know. It contains concrete facts regarding different kinds of belting and types of lacing. Also practical working rules and simplified formulas for making calculations. The book is a gold-mine of information for every owner of belt-driven machinery. Just what you want for ready reference. Widely used in Technical and other colleges. Thorough and authoritative. Copy sent free on request. Write today.

FLEXIBLE STEEL LACING CO.
4619 Lexington Street **Chicago, Ill., U. S. A.**
135 Finsbury Pavement, London, E. C., England

NON-FLUID OIL

You Don't Need All Those Different Oils!

Use A No. 00000

TRADE MARK REGISTERED IN
NON-FLUID OIL
UNITED STATES PATENT OFFICE

The "All-Purpose" Grade

So named by Mill Men because it can be used almost anywhere in the mill—replacing different kinds of oil such as machine oil, loom oil, motor oil, shafting oil, etc., etc.

It lasts longer—three to five times as long as liquid oil—and stops oil stains on goods.

Let us send you a sample.

Just fill out the coupon and mail.

New York & New Jersey Lubricant Co.
401 Broadway **New York**

Southern Agent:
Lewis W. Thomason,
Charlotte, N. C.

Ample Stocks at Our Branches
Atlanta, Ga.
Charlotte, N. C.
New Orleans, La.

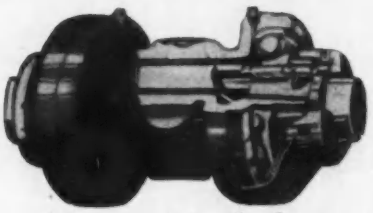
N. Y. & N. J. Lubricant Co.
Please send Testing Samples and Bulletin on "Lubrication of Textile Machinery" to

Name .....

Address .....

C.8-21

FRICTION CONSUMES POWER



That's why we cannot impress you too strongly with the fact that Chapmans, through their proven ability to overcome friction will cut power costs **15% to 40%**

At surprisingly low cost your plant may be Chapman-ized and without changing your present hanger frame equipment.

The minute such replacement is completed, you'll start to save money on power costs. The more you work Chapmans, the greater the savings. Get our literature and figure it out.

BALL BEARINGS
Chapman
YOU PAY FOR THEM WHETHER YOU BUY THEM OR NOT

TRANSMISSION BALL BEARING COMPANY
1061 MILITARY ROAD BUFFALO, N. Y.
Branches: New York, Chicago, Philadelphia, Cambridge, Mass., Toronto, Can.
Representatives in Principal Cities.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also proceed merit as surely in machinery as in men.

Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY
ENGINEERS—FOUNDERS—MACHINISTS
PHILADELPHIA, PENNA.
Branch Office, 141 Milk St., Boston, Mass.
20

BROKEN MACHINERY

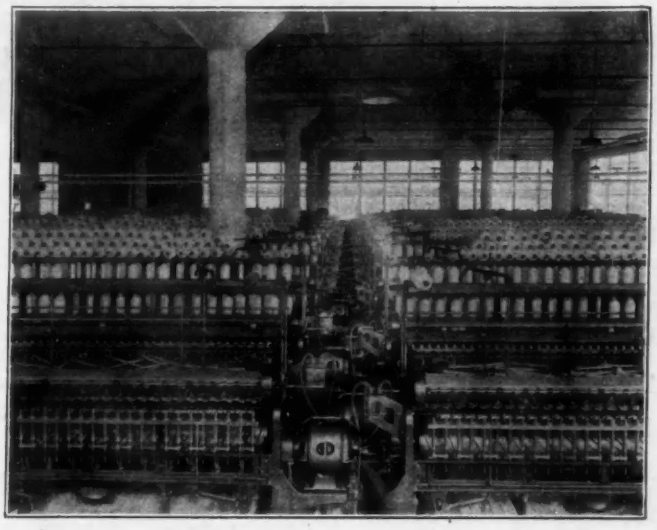
can quickly and economically be repaired by the oxy-acetylene process, which is the most reasonable way in which to avoid the expense of replacing a broken part. But, in order to obtain the most economical results, it is vitally essential that you have the proper equipment.

STANDARD
WELDING APPARATUS
and Supplies

need no introduction in the Southern Textile Field. Located where we are, we are able to supply your needs at a nominal cost. The proper oxygen to use is STANDARD OXYGEN, owing to the fact that it is 99.5 per cent pure. STANDARD is the first company in the South to manufacture oxygen, and satisfaction is assured by prompt shipments, full measure, and ABSOLUTE PURITY. This satisfaction is attested to by the fact that our business has increased over 800% in the last two years.

There is a service station located near you. Write today and get the full details.

STANDARD GAS PRODUCTS CO.
INCORPORATED
Oxygen, Oxy-Acetylene Welding and Cutting Machines and Supplies.
MAIN OFFICE: ATLANTA, GA.
Gretna, La. Chattanooga, Tenn.



Textile Motors

Allis-Chalmers Spinning Frame Motors are especially designed for the work.

They are your assurance of uninterrupted service with the minimum amount of attention.

Write for Bulletin.

ALLIS-CHALMERS

MILWAUKEE, WIS. U. S. A.

Speed in Service is Only Rivaled by Accuracy
Each Would Be Useless Without the Other

Unfailing Service

In the struggle and stress of modern business life every moment of delay represents a loss of time and money which cannot be regained.

When promptness, accuracy and dispatch are the vital elements in the delivery of electric equipment or supplies it is natural to turn to the Carter Electric Company for service.

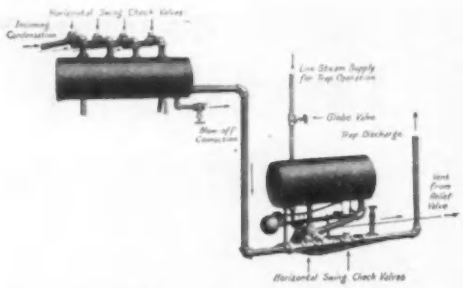
This is an organization whose members are trained to meet the demands of any emergency and this organization is ready to serve you on an instant's notice.

If your requirements cover Rubber Conduit Wire, Switches, Safety Switches, Wiring Devices, Fuses, Lamps or other electric supplies, it is only a matter of a few hours before we can place them in your hands.

This is because our warehouses are always fully stocked—everything you may need and in large quantities—and with every modern facility for handling your business the Carter Electric Company pledges you **Unfailing Service.**

Carter Electric Company

63 Peachtree Street, Atlanta



Reduces Fuel Costs; Speeds Up Production

Because it drains steam heated equipment of all condensation, the Morehead Back-to-Boiler System helps to speed up production.

Returning the condensation direct to boilers, the Morehead System also reduces fuel costs.

It insures perfect circulation of steam.

It makes unnecessary the operation of a fuel-wasting steam pump.

It is easily attached to any boiler room equipment.

Write for complete explanation as to how the Morehead System speeds up production and reduces fuel costs an average of 20 per cent.

Morehead Manufacturing Company
Dept. C
Detroit, Mich.

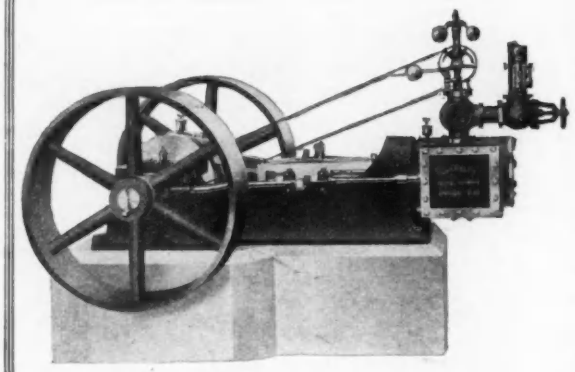
Canadian Morehead Manufacturing Company
Woodstock, Ontario.
For Dominion of Canada.

(27)

Positively Drains All Types of Steam Apparatus — Delivers Condensation And Feed Water to Boiler, Under All Conditions at Maximum Temperature

Morehead

"BACK-TO-BOILER-SYSTEM"



J. S. Schofield's Sons Co.

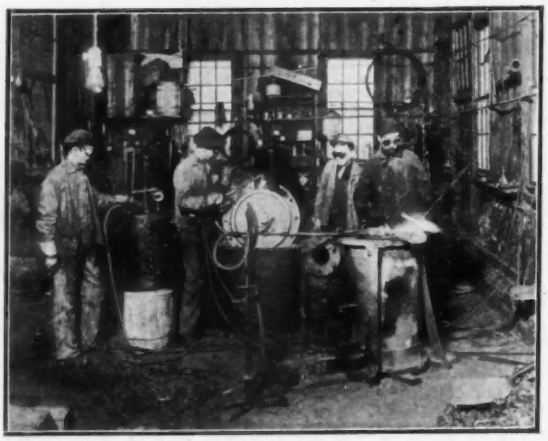
Macon, Georgia

MANUFACTURERS OF

High Pressure Return Tubular Boilers, High Grade Stationary Steam Engines, Tanks, Stacks, Stand Pipes.

Heavy Castings and Wrought Iron Works.

QUICK WELDING SERVICE



Welding a cylinder, 2090 lbs. and cylinder head 3 inches thick weld 20 inches—for Block Coal Co., Block, Tenn.

DON'T DISCARD YOUR BROKEN PARTS OUR SERVICE SAVES TIME AND MONEY

There is no need of discarding broken machines and machine parts—there is no need of shutting down and waiting an indefinite length of time for delivery of new parts.

Many mills know through experience that should a machine breakdown occur, it can be put back in operation quickly by calling on AUTOGENOUS.

We have just completed the repair on the crosshead and main bearing of a 1200 H.P. engine for the Brookside Cotton Mills. Practically every cotton and knitting mill in the vicinity of Knoxville has taken advantage of and profited by AUTOGENOUS Welding Service. Many of these jobs were extra large and caused a shutdown of the plant, and much time was saved by our quick service.

No matter how bad the break, no matter how small or large the machine or part, AUTOGENOUS Welding Service can save you money.

Full Details Sent on request. Wire, Phone or Write

AUTOGENOUS WELDING CO.

Oxy-Acetylene and Cutting in All Metals.
903-5 No. Central Ave., Junction Central and Broadway, Knoxville, Tenn.

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.

The Recognized Standards of Quality
COTTON YARNS

Gray Manufacturing Co.
Arrow Mills, Inc.
Parkdale Mills, Inc.
Flint Manufacturing Co.
Arkray Mills, Inc.
Arlington Cotton Mills
Myrtle Mills, Inc.

Our Fine Yarns Make Fine Fabrics

The manufacturers of a number of America's well known textile products can vouch for the strength, uniformity, cleanliness, and better weaving and knitting qualities of our yarns.

The yarns we spin for knitting, weaving, laces and converting, are furnished in all twists on skeins, cones, tubes and warps:

30s to 80s Single and Ply Combed Peeler Right Twist. 30's to 50's Single and Ply Double Carded Peeler, Right or Reverse Twist.

20s to 60s, 2, 3, and 4 Ply, Combed Peeler, Reverse Twist.

Our products are sold direct and exclusively through our General Sales Offices:
225 Fifth Avenue at 26th Street, New York.
H. A. FLORSHEIM, Sales Manager
Long Distance Phone:
Madison Sq. 7666-7-8 and 9.
BRANCH OFFICES { Boston, Philadelphia, Chicago

GRAY DAWN QUALITY YARNS Gray Manufacturing Co. Gastonia, N.C.

ARROW MILLS COMBED YARNS GASTONIA, N.C.

MYRTLE MILLS INC. COTTON YARNS GASTONIA, N.C.

PARKDALE MILLS, Inc. PARKDALE YARNS ARE THE BEST GASTONIA, N.C.

ARLINGTON COTTON MILLS COTTON YARNS GASTONIA, N.C.

ARKRAY MILLS FINE COMBED YARNS GASTONIA, N.C.

FLINT MFG. CO. TRADE MARK FLINT REG. U.S. PAT. OFF. GASTONIA, N.C.

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF

Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.

DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

HUGHES FAWCETT

IMPORTER AND COMMISSION MERCHANT

LINEN YARNS

For Weaving, Knitting and all Purposes.

TURKEY RED YARNS

For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine

And Every Description of Linen Thread and Twine

115 Franklin Street, : NEW YORK

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER — EDGAR H. BRIGHT

J. WILLIAM BARKDULL — C. MORGAN ABRAMS

MEMBERS OF

New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

A Service of Facts

Through contact with every phase of big business, and as a result of the exhaustive and constant study of economic conditions which is essential to the safe conduct of a great bank, the National Bank of Commerce in New York is able to render to its friends a peculiarly valuable service.

Broadly speaking, we are in a position to supply authoritative information, drawn from original sources, on practically every important matter related to commerce and industry, whether national or international.

Our friends, in this sensitive period of adjustment, are invited to employ this service to the fullest extent.

National Bank of Commerce in New York

Capital, Surplus and Undivided Profits
Over Fifty-five Million Dollars

"Cotton Mill Machinery Calculations"

EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on the subject obtainable.

The two volumes are illustrated with 45 diagrams and contain 21 reference tables.

As the value of a book lies in its contents and not in a fancy cover, we have put these two volumes out in a strong, serviceable binding. You can secure them in conjunction with a subscription to COTTON.

Write for circulars and full information.

The American Audit Co.

F. W. LAFRENTZ, C. P. A., Pres. — Telephone Ivy 869
H. M. RICE, C. P. A., Vice-Pres. — Cable Address
A. F. LAFRENTZ, Secy. & Treas. — Amdit, New York

NEW YORK—100 Broadway (Home Office).
33rd St. and 5th Ave., Waldorf-Astoria.
ATLANTA BRANCH—1013-1017 4th National Bank Bldg.
CHICAGO—Marquette Building.
BOSTON—P. O. Square Bldg.
PHILADELPHIA—Bellevue Court Bldg.
BALTIMORE—Garrett Bldg.
WASHINGTON, D. C.—Colorado Building.
NEW ORLEANS—Maison Blanche.
RICHMOND, VA.—American National Bank Building.
LONDON, E. C.—50 Gresham St., Bank.
MILWAUKEE—Loan & Trust Bldg.
SCRANTON—County Bank Bldg.
Specialists in Cost Systems and Manufacturing Accounts.

C. B. BIDWELL, P. A., Resident Vice-President

CARVER-BEAVER YARN CO.

Successors to A. D. SALKELD & BRO., Inc.

ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED

366 BROADWAY, NEW YORK

ADVERTISING is an economy and cuts the cost of selling, making lower prices or better goods possible without sacrifice of the sellers' profits.

1865 **The Oldest National Bank in the Cotton States** 1921

The Atlanta National Bank

Statement of Condition

(Condensed) June 30, 1921

OFFICERS
ROBERT F. MADDOX
President
VICE PRESIDENTS
James S. Floyd
Geo. R. Donovan
Thos. J. Peeples
ASSISTANT CASHIERS
D. B. DeSaussure
R. B. Cunningham
Jas. F. Alexander
Leo Stillman
A. N. Anderson
J. S. KENNEDY, Cashier
DIRECTORS
W. L. Peel
R. F. Maddox
Albert E. Thornton
E. H. Inman
J. J. Spalding
Alfred Austell
S. C. Dobbs
Jas. L. Dickey
J. S. Floyd
Geo. R. Donovan
J. T. Holleman
Lloyd B. Parks
J. Epps Brown
Dr. W. S. Elkin
Wm. J. Davis
H. R. Durand
S. Y. Tupper

RESOURCES

Loans and Discounts	$18,606,221.83
United States Bonds	1,021,460.00
Other Bonds and Stocks	57,997.90
Stock in Federal Reserve Bank	75,000.00
Banking House	800,000.00
Customers' Liability Account Our Acceptances	100,000.00
Cash on Hand, Due from Banks and U. S. Treasurer	4,345,387.74
	$25,006,067.47

LIABILITIES

Capital Stock	$ 1,000,000.00
Surplus and Undivided Profits	2,030,654.52
Circulation	964,900.00
Acceptances for Customers	100,000.00
Rediscounts	2,062,500.00
DEPOSITS	18,848,012.95
	$25,006,067.47

The Atlanta National Bank

Active Designated Depository United States Government, State of Georgia, County of Fulton and City of Atlanta

IF YOU NEED BANKING SERVICE

in the South,
and especially in Georgia

You need The Citizens & Southern

Capital and Surplus $4,500,000

The Citizens & Southern system has completely equipped offices in Atlanta, Savannah, Macon and Augusta.

Each of these offices is connected with the others by direct private wires.

If you are a customer of either office, and want information or service of any kind from the other cities these wires and the complete organization are at your service.

Hundreds of direct correspondents all over the South make it possible to give you practically the same service wherever you want it.

The Citizens & Southern Bank

Atlanta—Marietta at Broad

Savannah Macon Augusta

"No account too large, none too small"

PLAN YOUR VACATION FOR THE LAND OF THE SKY

Appropriate and popular name for the glorious mountains of Western North Carolina.

America's foremost Summer Resort Section embracing such famous resorts as:

ASHEVILLE, TRYON, HENDERSONVILLE, WAYNESVILLE, HOT SPRINGS, BREVARD, FLAT ROCK, SALUDA

LUXURIOUS HOTELS
ATTRACTIVE BUNGALOWS
HOMELIKE BOARDING HOUSES

LOW SUMMER FARES

For complete information and illustrated literature communicate with

V. L. Estes, D. P. A. **G. C. Robson, T. P. A.**
R. H. Hamilton, T. P. A.
48 North Broad St., Atlanta, Ga.

SOUTHERN RAILWAY SYSTEM

THE MARTINIQUE

(Affiliated with Hotel McAlpin)
Broadway, 32nd and 33rd Streets
NEW YORK CITY

SITUATED IN CENTRE OF SHOPPING DISTRICT—Adjacent to Theatre Section

Entrance from Hotel to New York Subway and Hudson Tubes affording direct communication with the Pennsylvania and Grand Central Stations, also general Post Office and Railroad Stations at Jersey City.

The Restaurants offer a truly McAlpin Service—with Club Breakfasts, Special Luncheons and Dinners, also a la Carte Service—All at moderate prices.

600 ROOMS

PLEASANT ROOMS FROM $2.50 UP.
FRANK E. JAGO—Resident Manager

HOTEL TULLER
DETROIT, MICH.

600 Rooms **600 Baths**

$2.50 up, Single **$4.50 up, Double**

Agents Sample Rooms $5.00 per day

HEADQUARTERS IN DETROIT FOR

Old Colony Club
Detroit Automobile Club
Motion Picture Exhibitors' Assn.
Detroit Transportation Club

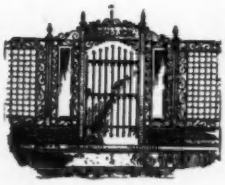
Table d'Hote Dinner $1.50 and $1.75
Business Men's Lunch .75.
Cafe A La Carte **Cafeteria** **Men's Grille**

SOUTHERN BUSINESS DIRECTORY

CONSTRUCTION

American Roofing & Paint Co., Inc.
Dealers in
PAINTS, VARNISHES, STAINS,
ROOFING, ROOFING MATERIALS
Roofing Contractors——::——Painting Contractors
Office, 246 Decatur St. P. O. Box 1065
Atlanta, Ga.

WELL DRILLING
and DEEP WELL PUMPS
We do the engineering and have been solving water problems satisfactorily for 25 years for textile mills.
Sydnor Pump & Well Co., Inc., Richmond, Va.



WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St., Baltimore, Md.

J. E. ROBBINS & SONS
PRACTICAL WELL DRILLERS
208 W. Coffee St.
P. O. Box 87 Phone: Long Distance 2985
Greenville, S. C.

GOODE CONSTRUCTION COMPANY
GENERAL CONTRACTORS
Charlotte, N. C.

GUDE & CO., Builders
CANDLER BLDG., - ATLANTA, GA.
All classes of buildings constructed promptly and efficiently and at reasonable prices.

COTTON, WASTE, LINTERS, Etc

E. A. CUTTS C. S. CUTTS, SR.
E. A. CUTTS COMPANY
Cable Address: "CUTTS"
COTTON BROKERS
30 Bay Street, East
Savannah, Ga.
Office Phones—478—2713—Postal Phone
Long Distance—9929

WELDING & REPAIRS

SOUTHERN WELDING CO.
927 ELLIS ST. AUGUSTA, GA.
Located in the cotton manufacturing center. We make a specialty of cotton mill work. Give us your particular jobs.
Established 1911.

FUEL & POWER SUPPLIES

Coal Is Now Moving

Place your order now for our KENTUCKY VELVET LUMP and there will be warmth and good cheer in your home. Ask some coal expert about this analysis.

Volatile matter	.38	Moisture	1.22
Fixed Carbon	.60	Sulphur	.32
Ash	1.10	B. T. U.'s	14948

We handle the Empire, one of the best mines in Alabama. Also steam and mine run coal from Kentucky and Tennessee.

Truitt Coal and Iron Company
ATLANTA, GEORGIA

Advertising conserves the Manufacturer's time by acquainting him with a service or product at his leisure long before the need for such arises.

CLASSIFIED ADVERTISING

SALESMAN WANTED—To represent a large, well-known manufacturer of soluble oils and textile compounds in the South. Man with acquaintance in Southern textile field and experience in selling similar lines preferred. In replying give details of experience and salary expected. Correspondence will be held strictly confidential. Address Box B, care COTTON, Grant Building, Atlanta, Ga.

WANTED: Salesman—to promote the sale of sizing preparations, finishes, sulphonated oils, bleaching assistants, and other textile products used by cotton weaving plants, bleacheries, dye houses and finishing plants. Territory—Georgia, Alabama, Mississippi, Louisiana. Excellent opportunity for capable salesman with experience following a knowledge of application of textile products. Write fully, stating age, references, qualifications, whether now employed. Reply treated strictly confidential. Address Box 39 care COTTON, Atlanta, Ga.

WE are prepared to do the highest grade of machine work on reflecking, refluting and honing of spinning, speeder and mule rolls.

Orders solicited.

W. B. OSLER & CO.

50 Millidge Ave., Atlanta, Ga.

RATES:

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(When replies are to be received in our care, allow four words for box address.)

INDUSTRIAL ENGINEERING SERVICE

Industrial Engineers offer complete service in design and construction of Textile Mills, warehouses, mill villages, power plants, etc. We can assist in financing meritous enterprises. Give full particulars when writing. Box 29 care COTTON, Atlanta, Ga.

A well established London firm with excellent connections seeks British agency for manufacturer of Motor Fabrics, Cotton Duck, etc. None but principals dealt with, and only manufacturer capable of dealing with large business desired. Highest references given and required. Write Z. R. 308, care Deacons, 7 Leadenhall Street, London, E. C.

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,

127-31 N. Third St.

Philadelphia, - Pennsylvania

Do You Want To Sell It?

Probably you, like many other mills, have some equipment or machinery which you have taken out, or are thinking of taking out and replacing with new equipment.

Why not dispose of this second-hand equipment at a profit. COTTON is read by thousands of Cotton Mills that are hardly touched by Northern journals.

You Can Sell Your Second-Hand Equipment

to these mills through advertising in the Classified Advertising Section of COTTON. Such advertising produces results at small cost—why not try it out and get that second-hand equipment off your hands in a profitable way? Tell us what you have for sale and let us insert an advertisement for you.

COTTON

Grant Building, Atlanta, Ga.

BUY IT AT OLD HICKORY

Where the Surplus Stocks of Machinery from the Government's $87,000,000 Project Are Being Sold at Surprisingly Low Prices

Sterling Boilers

44—823 H.P. Sterling Boilers, Class M-30, complete with all accessories. Babcock & Wilcox Co., New York, makers. 200 lbs. pressure, 630 3½-inch tubes, No. 10 gauge. 150 of these tubes are circulators. Steam drums double riveted, double strap butt joint, 1-inch rivets. Thickness shell plates and tube sheets in steam drum ⅞ inch, mud drum 1 inch. Space occupied by boiler 18 feet by 22 feet 3 inches by 29 feet 9 inches high.

Stokers—4-S Retort, double dump underfeed stokers, with line shafting, etc., manufactured by Westinghouse Electric Co., Stoker Extension hoppers.

Stoker Engines—8 x 8 Buffalo Forge Co., Vertical Engines, single acting, inclosed, Class A, rated at 32 H.P., 350 R.P.M., equipped with 1-2½ governor, 1--2½ throttle valve, Jenkins Valve Co. Stoker Drive 17 x 20 x 3, silent Morse chain.

Fan and Turbine—1 Turbo-Conoidal Fan, Buffalo Force Co., Type T-D No. 9½ double inlet, 100,000 cu. ft. per minute at 6" water pressure and 970 R.P.M., driven by 225 H.P. horizontal, multi-stage, non-condensing Moore Turbine and reduction gear. throttle valve 3". Steam Consumption at 180 H.P. 31-6 lbs. at 225 H.P. 33-2 lbs. Turbine and reduction gear. Manufactured by Moore Steam Turbine Co., Wellsville.

Accessories for Each Boiler.

1—12" Ashcroft, 400 lb. steam gauge.
4—4½" Consolidated safety pop valves.
1—3" Pratt & Gady Feed valve.
2—2½" Elliott blow-off valves.
1—8" Foster non-return valve.
1—6" Vulcan soot blower.
1—Bailey flow meter, rated flow 28,600 lbs. hr., max. flow 70,000 lbs. per hour.

These boilers have been tested under steam pressure but never operated.

Pumps

Motor Driven Centrifugal.

10—14-in. Worthington, Class B, double suction, 8,600 G.P.M. at 152 feet head, at 1,170 R.P.M. direct connected to 300 H.P. General Electric, 3 phase, 60 cycle, 2300 volt, 1700 R.P.M. motors.

4—14-in. Allis-Chalmers, Type S, 7500 G.P.M. at 130 feet head, at 1760 R.P.M. direct connected to 150 H.P. General Electric, 3 phase, 60 cycle, 2300 volt motors.

2—10-in. Allis-Chalmers, Type S, 3750 G.P.M. 130 feet head direct connected to 100 H.P. General Electric, 3 phase, 60 cycle, 2300 volt motors.

3—6-in. A.W.W., 1000 G.P.M. 125 lbs. pressure, direct connected to 150 H.P. Westinghouse, 3 phase, 60 cycle, 2300 volt, 1765 RP.M. motor.

Steam Turbine Driven Centrifugal.

6—16-in. Allis-Chalmers, Type S, 8500 G.P.M. at 90 feet head, direct connected to Type L, 300 H.P., 2000 R.P.M. steam turbine.

6—14-in. Allis-Chalmers, Type S, 6500 G.P.M. at 150 feet head, 8100G.P.M. at 90 feet head, direct connected to 300 H.P. 2000 R.P.M. steam turbine

Steam Actuated Hydraulic.

6—14 and 20 x 7½ x 18 Worthington Compound Duplex outside and pocket plunger, 400 G.P.M. at 300 lbs. pressure.

10—25 and 38 x 4⅝ x 24 Worthington Tandem Compound Duplex, outside end pocket, 3600 lbs. pressure, 150 G.P.M. at 20 R.P.M.

2—20 x 12 x 16 Worthington Duplex Underwriter Fire Pumps, 1500 G.P.M., 100 lbs. pressure.

200—New and used boiler feed Worthington Pumps, 3 x 2 x 3, 4½ x 2¾ x 5, 5½ x 3½ x 5, 6 x 4 x 6, 12 x x 7 x 10.

Corliss Engines

27—18 x 36 Heavy Duty, Allis-Chalmers Corliss Engines, both right and left hand, 125 R.P.M., 350 H.P. 11 ft. x 32 in. Band Wheel, operated on 140 lbs. steam, 1½-in. gauge back pressure double eccentric.

Engines have been used ten days to three months and are practically new.

Transformers

6—600 K.V.A. Westinghouse Transformers (40° C.), outdoor type, 60 cycle, single phase, 600-1200-2400 volt privary, 6300 volt secondary. Complete with oil. Transformers arranged with taps for starting 300 H.P., 2200 volt, 3 phase motors. Transformers on new AIEE rating at 550° C., 750 K.V.A.

27—250 K.V.A. Westinghouse Outdoor Type Transformers, 2300-460 volt, 60 cycle, single phase, Spec. No. 159463-A.

18—250 K.V.A. Allis-Chalmers Outdoor Type Transformers, 2300-230-440 volt, 60 cycle, single phase.

3—100 K.V.A. Westinghouse S.K. Transformers, outdoor type, 6600 volt, 2200-2000, 60 cycle, single phase.

500-H. P. Keeler Boilers

5—500 H.P. Keeler Water Tube Boilers, 160 lb. pressure, Wetzel stokers. Three new, two used 60 days. Immediate delivery. At a bargain.

Steel Tanks

4000 Steel Tanks, all sizes and shapes. 9 x 36, 8 x 36, 8 x 30 Storage Tanks. Weight tanks, with scales. Round storage tanks, with cover of every size. Small Tanks of every size.

Pipe and Pipe Covering

200 Miles of Practically New Pipe.

26,000 ft. 16 in.	6,930 ft. 7 in.
17,300 ft. 14 in.	37,920 ft. 6 in.
9,800 ft. 12. in.	13,870 ft. 5 in.
12,870 ft. 10 in.	21,600 ft. 4 in.
18,335 ft. 8 in.	68,400 ft. 3 in.

Thousands of feet 2½ in. and smaller. Thousands of feet of hydraulic pipe of all weights.

All of this pipe has been above ground, covered and a great deal has never been used, though installed. Can deliver promptly. Will be sold on a tonnage basis.

Thousands of feet of serviceable 85% Magnesia Covering and lagging, all sizes. Large quantity of all sizes cork covering and fittings.

Relaying Rail

600 tons 80 lb. A S C E Section.
1600 tons 67½ Russian Section.
100 tons 25 lb. section.
176 15 ft. Sections, 12 lb. portable track with switches.
Switches, frogs, crossings, Ellis bumping posts.
Track material of all kinds.

Motors

Single Phase, 60 Cycle.

No.	H.P.	Volts
4	⅛	110
1	⅙	110
1	¼	110
5	½	110

Three Phase, 60 Cycle.

No.	H.P.	Volts
11	½	440
2	1	440
3	1½	440
1	1¾	220
20	2	440
5	3	220
13	3	440
1	5	220
39	5	440
3	7½	220
255	7½	440
5	10	440
90	10	440
115	15	440
6	20	440
20	25	440
33	30	440
28	40	440
7	50	440
5	75	440
1	100	440
1	150	2200
2	300	2200

The above motors are standard makes, of various types and speeds.

Send us your specifications; we can fill them.

Belting

Thousands of feet of new Condor and Anaconda Belting in lengths ranging from 100 to 500 ft. in practically all widths and from 2 to 10 ply. Write for Bulletin No. 5.

Plant Sites

Complete factories and plant sites, in the heart of the Central South are now available at extremely low terms. Write our Industrial Department for information.

THE NASHVILLE INDUSTRIAL CORPORATION

JACKSONVILLE, TENN.

Buyers' Index

Acetylene Welding Apparatus.
(See Welding Apparatus).

Acetylene Gas.
Commercial Acetylene Supply Co.
Southern Welding Co.
Standard Gas Products Co.

Accountants.
(See Auditors and Accountants).

Adding Machines.
Monroe Calculating Mch. Co.

Air Brakes.
Allis-Chalmers Mfg. Co.

Air Washers.
American Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.
Sturtevant Co., B. F.

Air Conditioning Systems.
(See Humidifying Apparatus).

Albone.
Roessler & Hasslacher Chemical Co.

Alkalies.
(See Dyestuffs and Chemicals).

Aniline Colors.
(See Dystuffs and Chemicals).

Anti-Chlornie.
(See Dyestuffs and Chemicals).

Aprons-Rub.
Smith & Furbush Machine Co.

Architects and Engineers.
Hearne System.
Lockwood, Greene & Co.
Robert & Co.
Spiker & Lose.
Sirrine, J. E.
Thompson & Binger, Inc.
Tufts Co., Arthur.

Ash Handling Machinery.
(See Coal Handling Machinery).

Asphalt Slate Shingles.
(See Slate Asphalt Roofing).

Auditors and Accountants.
American Audit Co.
Ernst & Ernst.

Auto Trucks.
(See Trucks—Auto).

Automatic Controllers (Temperature).
(See Temperature Controllers.)

Automatic Loom Attachments.
(See Loom Attachments).

Automatic Feeds for Cotton.
Proctor & Schwartz, Inc.
Saco Lowell Shops.
Sargent's Sons Corp., C. G.
Smith & Furbush Mch. Co.
Whitin Mch. Works.

Automatic Guider (Electric).
Blake Electric Mfg. Co.

Backwashers.
Sargent's Sons Corp., C. G.

Automatic Scales.
(See Scales).

Ball Bearings.
Aldrich Mch. Works.
Campbell Mfg. Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
S K F Industries.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.

Ball Bearing Housings.
Aldrich Mch. Works.
Fafnir Bearing Co.

Ball Bearing Top Rolls.
Campbell Mfg. Co.

Bale Band Buckles.
(See Box Strapping & Buckles).

Bale and Box Ties.
Lovingood Co.
Signode System, Inc.

Baling Machines.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Famous Mfg. Co.
Galland-Henning Mfg. Co.
Williams & Sons, I. B.
Hulme, J. S.
Saco-Lowell Shops.

Baling Presses.
(See Presses).

Bandages, Tapes, Etc.
American Textile Banding Co.

Bands.
(See Tapes).

Banding Straps and Buckles.
Lovingood Co.
Signode System, Inc.

Bands (Self-Tying).
Campbell Mfg. Co.

Banks.
Atlanta National Bank.
Citizens & Southern Bank.
National Bank of Commerce In New York.
National Shawmut Bank.

Barometers (Mercurial).
Taylor Instrument Co.

Barrels—Fibre.
(See Fibre Products).

Baskets—Mill.
(See Boxes—Mill).

Bath Cabinet—Shower.
Crane Co.
Manufacturing Equipment & Engineering Co.
Sanymetal Products Co.

Batteries (Elec.).
(See Storage Batteries).

Beam Dyeing Machines.
Cocker Mchry. & Foundry Co.

Beaming and Warping Mchry.
(See Warpers and Warping Machinery).

Bearings.
Cresson-Morris Co.
Diamond State Fibre Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
S K F Industries.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Wood's Sons Co., T. B.

Belting.
American Supply Co.
Augusta Mill Supply Co.
Russell Mfg. Co.
Walraven Co.
Williams & Co., I. B.

Belting—Chain Link.
Link-Belt Company.
Morse Chain Co.

Belting—Rope.
(See Rope Transmission).

Belt Conveyors.
Link-Belt Company.
Morse Chain Co.

Belt Dressing.
Jos. Dixon Crucible Co.
Walraven Co.
Williams & Co., I. B.

Belt Fasteners.
Flexible Steel Lacing Co.

Belt Lacing.
Augusta Mill Supply Co.
Flexible Steel Lacing Co.
Walraven Co.

Belt Tighteners.
Link-Belt Company.
Williams & Sons, I. B.
Wood's Sons Co., T. B.

Bench Drawers.
Lupton's Sons, Co., David.

Bench Legs (Pressed Steel).
Lupton's Sons, Co., David.

Benches (Park and Playground).
(See Playground Equipment).

Bleacheries.
(See Dyers, Bleachers and Finishers).

Bleaching Kiers.
Butterworth & Sons Co., H. W.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machinery Co., The.

Bleaching Machinery.
(See Dyeing, Bleaching and Finishing Machinery).

Bleaching, Finishing and Sizing Materials.
(See Finishing Materials).

Blowers and Blower Systems.
American Blower Co.
Carrier Eng. Corp.
Clements Mfg. Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Boards—Fibre.
Diamond State Fibre Co.

Boards—Form.
Pearson, Jos. T.

Bobbins.
Draper Corporation.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.
Shambow Shuttle Co.
Walraven Co.
Whitin Machine Works.

Bobbin Heads.
Diamond State Fibre Co.

Boilers.
International Engineering Works, Inc.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Boiler Feed Water Purification.
American Water Softener Co.
Hulme, J. S.
Norwood Engineering Co.
Permutit Co.
Scaife & Sons, Wm. B.

Boiler Room Fittings & Supplies.
Crane Co.
International Engineering Co.
Lunkenheimer Co.
Nashville Industrial Corp.
Sturtevant Co., B. F.

Boiler Grates and Stokers.
(See Grates and Stokers).

Boiler Graphite.
Jos. Dixon Crucible Co.

Bookkeeping Machines.
Monroe Calculating Mch. Co.

Box Strapping and Tie Buckles.
(See Banding Straps & Buckles).

Boxes—Mill.
Diamond State Fibre Co.
Hightower Box & Tank Co.
Lane & Bros., W. T.
Standard Fibre Co.

Boxes—Packing.
(See Packing Boxes).

Boxes (Steel).
Lyon Metallic Mfg. Co.

Braid.
(See Tapes).

Brake Linings.
Diamond State Fibre Co.

Brazing.
(See Welding).

Brokers—Cotton.
(See Cotton Dealers & Brokers).

Brokers—Stock.
(See Stocks and Bonds).

Brooms.
(See Brushes.

Brushes—Mill.
Atlanta Brush Co.
Harris Broom Co.
Southern Brush & Broom Co.
Southwestern Broom Mfg. Co.

Brushes—Commutator.
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Buckets and Pails—Mill.
Diamond State Fibre Co.
Standard Fibre Co.

Buckets—Elevator and Grab.
Link-Belt Company.

Buckles—Cotton Tie.
(See Box Strapping and Ties).

Building Contractors.
(See Contractors).

Buildings—Portable.
Seawell, Luke.

Building Material.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co., The.
Birmingham Slag Co.
Dowman, Geo.
Dufur & Co.
Lockwood, Green & Co.
Long Bell Lumber Co.
Lupton's Sons Co., David
Sanymetal Products Co.
Seawell, Luke.
Southern Cotton Oil Co.
Southern Cypress Mfg. Asso.

Bungalows.
(See Houses—Ready Built).

Burr Pickers.
Sargent's Sons, C. G.
Smith & Furbush Machine Co.

Bushings.
Diamond State Fibre Co.
Southern Spindle & Flyer Co.
Shambow Shuttle Co.
Walraven Co.

Cabinets.
(See Lockers).

Calculating Machines.
Monroe Calculating Mch. Co.

Calenders.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co.

Calender Rolls.
Campbell Mfg. Co.
Butterworth & Sons Co., H. W.
Roy & Son, B. S.
Textile Finishing Machinery Co.

Calling System—Inter-Telephone.
Carter Electric Co.

Cans—Roving.
Diamond State Fibre Co.
Standard Fibre Co.

Canvas Lugs.
Augusta Mill Supply Co.

Cars and Trucks—Fibre.
(See Trucks).

Carbonizing Machines.
Cocker Mch. & Fdry Co.
Klaude-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Salem Iron Wks.
Sargent's Sons & Co., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Mch. Wks.

Carding Machinery and Supplies.
Howard Bros. Mfg. Co.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Card Clothing.
Howard Bros. Mfg. Co.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Card Feeds.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Whitin Machine Co.

Card Grinding Machinery.
Roy & Son Co., B. S.
Smith & Furbush Mach. Co.
Whitin Machine Works.

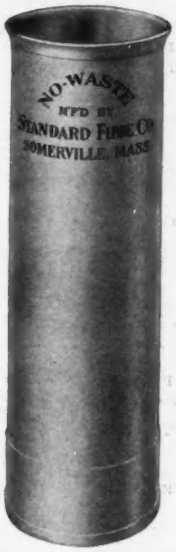
WRITE US
for catalog on
other
Mill Receptacles.

No-Waste
SEAMLESS ROVING CANS
Glass Hard and Smooth as Silk

Waste Baskets
Taper Baskets
Oval Cans
Elliptical Cans

Sizes
9"-10"-11-12"-14"-18"
diameters
and
up to 45" high

NO
seams, joints
or
Rivets.



Styles

Polished
Steel
or
Rolled Fibre
Top Rims
Rings
BEADED
securely
to
Hard Fibre
Shells

Hard Fibre
MILL BARRELS
Plain Fibre
and
NEW PATTERN
Steel Clad
Trucks and Boxes
Combination
Doffing Cars

STANDARD FIBRE CO.
Somerville, Massachusetts

THIRTY-EIGHTH SESSION
PHILADELPHIA TEXTILE SCHOOL
OF
The Pennsylvania Museum and School of Industrial Art
DAY SCHOOL opens September 21, 1921.
EVENING SCHOOL opens October 10, 1921.
Two Diploma Courses are offered in the Day School.
The Regular Textile Course—Three Years Thorough and Comprehensive.
The Chemistry, Dyeing and Printing Course—Three Years Dealing with all Textile Fibres.
Two Year, abridged, Certificate Day Courses in Cottons, Woolens and Worsteds, Silks, Jacquard Design, admission to which may be had by substituting practical work for a portion of the college entrance units required in the Diploma Courses.
Application should be filed at least two weeks prior to the opening day.
Circulars giving details of Day and Evening Schools may be had by applying to
E. W. FRANCE, Director,
Broad & Pine Streets Philadelphia, Pa.

BUYING A PIG IN A POKE

The buying of advertising space used to be buying "a pig in a poke." The quantity and quality of circulation was shrouded in mystery and often the bag was tied against investigation.

That day has passed. The advertiser no longer depends on "mere claims." The Audit Bureau of Circulation has untied the strings to the sack and the circulation of the better class of publications is thrown open for the most searching scrutiny.

In buying space in COTTON you are not buying "a pig in a poke." Our A. B. C. statements will stand the analysis of the most exacting investigator.

"Cotton Mill Machinery Calculations"

EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on the subject obtainable.

The two volumes are illustrated with 45 diagrams and contain 21 reference tables.

As the value of a book lies in its contents and not in a fancy cover, we have put these two volumes out in a strong, serviceable paper binding. You can secure them in conjunction with a subscription to COTTON.

Write for circulars and full information.

COTTON,
ATLANTA, GEORGIA

BUYERS' INDEX—Continued.

Carpet Machinery.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Wks.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Carrier Aprons.
(See Aprons).

Carrier System.
Dowman, George.
Richards-Wilcox Mfg. Co.

Cases—Wooden.
(See Boxes).

Casement Window Hardware.
Richards-Wilcox Mfg. Co.
Seawell, Luke.

Castings.
Cresson-Morris Co.
Lombard Foundry & Mch. Co.
Walsh & Weidner Boiler Co.

Caustic Soda.
(See Bleaching Materials).

Cement Reinforcement.
Birmingham Slag Co.

Cement and Brick Coating.
Dixon Crucible Co., Jos.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth Howland & Co., Inc.

Central Station (Electric).
Georgia Railway & Power Co.

Centrifugals.
Cresson-Morris Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

Chain Drives.
(See Belting—Chain Link).

Chain—Block, Bicycle, Auto, Engine, Agricultural, Etc.)
Morse Chain Co.

Chairs and Stools.
Lyon Metallic Mfg. Co.
Manufacturing Equipment & Engineering Co.
Monarch Theatre Supply Co.

Chemicals.
(See Dyestuffs and Chemicals).

Chlorine Gas.
Electro Bleaching Gas Co.

Cleaning Machine—Blower.
Clements Mfg. Co.

Clocks—Hank, Etc.
(See Counters).

Clocks—Time.
Service Recorder Co.

Clocks—Watchman.
Chicago Watchman Clock Co.

Closets—Water.
(See Toilets).

Cloth Cutters.
Firsching, J. A.
Wildman Mfg. Co.

Cloth Guider (Electric).
Blake Electric Mfg. Co.

Cloth Room Machinery.
Butterworth, H. W., & Sons Co.
Firsching, J. A.
Saco-Lowell Shops.
Scott & Co., Henry L.
Textile Finishing Machinery Co.
Wildman Mfg. Co.

Cloth Shrinking Machinery.
Reliance Machine Works.
Tolhurst Mch. Wks.

Cloth Testers.
Scott & Co., Henry L.

Cloth Winders.
(See Winders).

Clutches—Friction.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Link-Belt Company.
Wood's Sons Co., T. B.

Clutch Linings.
Diamond State Fibre Co.

Coal.
Truitt Coal & Iron Co.
U. S. Fuel Corp.

Coal & Ash Handling Machinery.
Link-Belt Company.

Coal Tar Disinfectants.
(See Disinfectants).

Cocks.
(See Valves).

Color Pails.
(See Buckets—Mill).

Comb Aprons.
(See Aprons).

Commission Merchants & Dealers.
(See Cotton Cloth Commission Merchants).

Compressors—Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Walraven Co., The.

Concrete Reinforcement.
Birmingham Slag Co.

Condensers.
Allis-Chalmers Mfg. Co.

Conduits.
Diamond State Fibre Co.

Condulets.
Crouse-Hinds Co.

Connectors—Frankel Solderless.
Westinghouse Elec. & Mfg. Co.

Consulting Engineers.
(See Architects and Engineers).

Contractors and Engineers—Building.
Fonda Organization, The E. A.
Goode, R. L.
Gude & Co.
Hearne System.
Robbins & Sons, J. E.
Spiker & Lose.
Thompson & Binger.
Tufts Co., Arthur.

Contractors—Electrical.
(See Electrical Engineers.

Contractors—Painting.
American Roofing & Paint Co.
Marshall Co., H. Newton.

Contractors (Piping.)
Marshall Co., H. Newton.

Contractors (Roofing.)
American Roofing & Paint Co.
Marshall Co., H. Newton.

Controlling Instruments—Temperature.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.

Conveyors—Belt.
(See Belt Conveyors).

Conveying Machinery.
American Supply Co.
Collins, J. D.
Cresson-Morris Co.
Dowman, George.
Hulme, J. S.
Link-Belt Co
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Richards-Wilcox Mfg. Co.
Schofield, Wm. Co.
Walraven Co.

Conveyors—Portable.
Dowman, George

Coolers.
(See Humidifying Apparatus.)

Coolers—Water.
(See Water Coolers).

Cooling and Conditioning Machines.
Manufacturers Machine Co.

Cooling Towers.
(See Tanks and Towers).

Copper Stamps and Stencils.
(See Stamps, Stencils, Etc.)

Cordage Machinery.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Cotton Yarn and Cloth Commission Merchants and Dealers.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Weimar Bros.
Woodward Baldwin & Co.

Cotton Merchants and Brokers.
Beer, H. & B.
Cutts, E. A.

Cotton Mills.
Gray Mfg. Co.

Cotton Mill Machinery and Supplies.
Augusta Mill Supply Co.
Barber-Colman Co.
Blake Electric Mfg. Co.
Boston Machine Works Co.
Butterworth & Sons, H. W.
Cocker Mach. & Foundry Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Eclipse Textile Devices, Inc.
Firsching, J. A.
Fletcher Works.
Greist Mfg. Co.
Greenville Spool & Mfg. Co.
Howard Bros. Mfg. Co.
Howard & Bullough.
Hunt Automatic Stop Motion, Inc.
Manufacturers Machine Co.
Phila. Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Service Recorder Co.
Shambow Shuttle Co.
Slaughter Mchry. Co., G. G.
Smith & Furbush Mach. Co.
Southern Bending Co.
Stafford & Co.
Steel Heddle Mfg. Co.
Terrell Machine Co.
Textile Fininshing Machinery Co.
Tolhurst Mch. Wks.
Universal Winding Co.
Walraven Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

Cotton Tape Loom.
Fletcher Works.
Schaum & Uhlinger.

Cotton Yarn Mills.
(See Yarn Manufacturers).

Counters—Revolution, Hank, Pick, Etc.
Boston Machine Works.
Slaughter, G. G.

Counters (Time).
Service Recorder Co.

Counters—Restaurant.
(See Restaurant Equipment.)

Coupling—Shaft.
Cresson-Morris Co.
Wood's Sons Co., T. B.

Covers—Rollers.
Diamond State Fibre Co.

Cranes.
(See Hoists).

Crayons.
Dixon Crucible Co., Jos.
Lovingood Co.
Lowell Crayon Co.

Crushing Machinery
Allis-Chalmers Mfg. Co.

Cutters—Cloth.
(See Cloth Cutters).

Cypress Lumber.
Southern Cypress Mfg. Asso.

Cutters—Thread.
(See Thread Cutters).

Dehumidifying.
Sturtevant Co., B. F.

Delivery Cases.
(See Boxes—Packing).

Desks (Factory).
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.

Dial Scales.
(See Scales).

Dies—Steel.
(See Stamps, Stencils, Etc.).

Discs—Fibre.
Diamond State Fibre Co.

Disinfectants.
Barrett Co., The
Sanitas Co.

Dobby Chains.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

Doffing Boxes—Mill.
(See Boxes—Mill).

Doffing Cars.
(See Cars).

Door Closers and Checks.
Richards-Wilcox Mfg. Co.
Seawell, Luke.

Door Hangers.
Dowman, George.
Richards-Wilcox Mfg. Co.

Door Mats—Steel.
Lovingood Co.

Doors—Steel.
Lupton's Sons Co., David

Draft Gauges.
(See Gauges—Draft).

Drawing Frames.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Drills—Electric.
(See Electric Machinery).

Drinking Fountains.
(See Fountains—Drinking).

Drop Wires.
Greist Mfg. Co.
Steel Heddle Mfg. Co.

Drying Apparatus.
American Blower Co.
Sturtevant Co., B. F.

Drying Forms—Hosiery.
Pearson, Jos. T.

Drying Machinery.
American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

Dust Collectors.
(See Blowers and Blowing Systems).

Dusting Machinery.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Dyers, Bleachers and Finishers.
American Yarn & Processing Co
Franklin Process Co.
King, Habersham.

Dyeing, Bleaching, Finishing and Printing Machinery.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Hulme, J. S.
Klauder-Weldon Dyeing Mch. Co.
Manufacturers Machine Co.
Permutit Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Salem Iron Wks.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

Dyeing Machines (Package and Spool.)
Franklin Process Co.

Dye Sticks.
Phila. Drying Machinery Co.

Dyestuffs and Chemicals.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Metz & Co., H. A.
Mathieson Alkali Works, Inc.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Southern Distributing Co.
Staley Mfg. Co., A. E.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.
Zavon Co., Inc.

Electric Cleaning System—Suction.
Sturtevant Co., B. F.

Electric Conduit & Fittings.
General Electric Co.

UCPC

UNITED CHEMICAL PRODUCTS CORPORATION

York and Colgate Sts., Jersey City, N. J.

Our New Products:

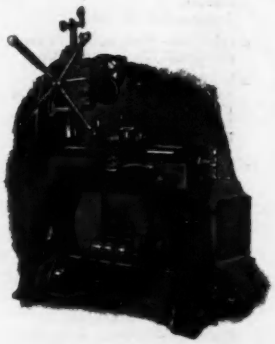
DIRECT SKY BLUE T CONC.
DIRECT BLACK E. U. CONC.
DIRECT BLUE 2 B CONC.
DIRECT BLUE 3 B CONC.
DIRECT BROWN G. C. CONC.
ALL SHADES OF NAVY BLUE & CORDOVAN

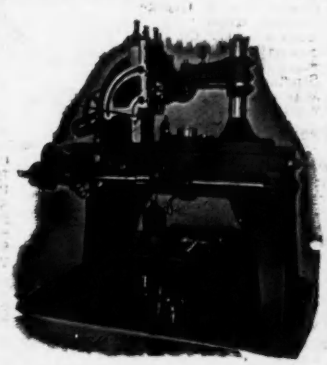
Southern Office, Realty Bldg., Charlotte, N. C.

REPRESENTATIVES: R. T. GRANT, Charlotte, N. C.
GEO. W. WATSON, Hazelhurst, Miss.
B. R. DABBS, Atlanta, Ga.

Full Automatic, Semi-Automatic and Hand Operated

Gear Cutting Machines





Especially adapted for use in Cotton Mills Hundreds now in use. Send for Special Circulars.

The D. E. Whiton Machine Co.,
NEW LONDON, CONN.

THE JOHNSON FRICTION CLUTCH

Write for our Catalog G.

FRICTION CONTROL MEANS BETTER MACHINERY

And we specialize in applying the proper type of friction clutch to meet any conditions.

In the textile plant, the highest efficiency in power transmission lies in the group drive from lineshaft with Johnson Clutch Control. Eliminate your inefficient countershafts and expensive individual motors.

Adopt the Johnson Lineshaft Drive

Johnson Clutches are available from stock in standard sizes, single and double, to fit all shaft and pulley dimensions.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

BUYERS' INDEX—Continued.

Electric Dynamos and Motors.
See Motors and Generators).

Electric Fans.
(See Fans—Electric).

Electric Lamps.
(See Lamps).

Electric Lamp Guards.
Flexible Steel Lacing Co.

Electrical Engineers and Contractors.
Huntington & Guerry, Inc.

Electrical Machinery and Supplies.
Allis-Chalmers Mfg. Co.
Blake Electric Mfg. Co.
Carter Electric Co.
Cooper-Hewitt Elec. Co.
Crouse-Hinds Co.
Cutter Works, George.
General Electric Co.
Hulme, J. S.
Slaughter Mchry. Co., G. G.
Walraven Co., The.
Walsh & Weidner Boiler Co.
Westinghouse Elec. & Mfg. Co.

Electric Tractors and Trucks.
(See Tractors & Trucks—Elec).

Elevators—Portable.
Collins, J. D.
Lovingood Co.

Elevators.
Link-Belt Company.

Doors& Elevator Enclosures.
Dowman, George.

Enamel—Mill White.
(See Paint).

Engineers—Mill.
(See Architects).

Engines—Oil, Gas and Gasoline.
Allis-Chalmers Mfg. Co.
Walraven Co., The.

Engines—Steam.
Allis-Chalmers Mfg. Co.
Lombard Iron Works & Supply Co.
Nashville Industrial Corp.
Schofield's Sons Co., J. S.
Sturtevant Co., B. F.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Engine Room Appliances and Supplies.
Crane Co.
Cutter Works, George.
Jenkins Bros.
Lunkenheimer Co.
Nashville Industrial Corp.
Slaughter Mchry. Co., G. G.
Sturtevant Co., B. F.
Walraven Co.
Westinghouse Electric & Mfg. Co.

Exporters—Cotton.
(See Brokers).

Extractors—Hydro.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Fans—Electric.
Allis-Chalmers Mfg. Co.
American Blower Co.
Carter Electric Co.
General Elec. Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Fans—Conveying, Power and Exhaust.
(See Blowers and Blowing Systems).

Fasteners—Belt.
(See Belt Fasteners).

Feed Water Purifiers.
(See Boiler Feed Water Purification).

Felting Machinery.
Smith & Furbush Mch. Co.

Fence—Steel and Iron.
Cyclone Fence Co.

Fibre Products.
Diamond State Fibre Co.
Standard Fibre Co.

Fillets (Calender and Doffer, Strippers, Burnishing and Emery.)
Howard Bros. Mfg. Co.

Filters—Water.
American Water Softener Co.
Hulme, J. S.
Norwood Engineering Co.
Permutit Co.
Scaife & Sons Co., Wm. B.

Filters—Oil Removal.
Norwood Engineering Co.
Permutit Co.
Sherwood Mfg. Co.

Filters—Sand.
Permutit Co.

Films (Moving Picture).
Monarch Theatre Supply Co.

Finishing.
(See Dyers, Bleachers and Finishers).

Finishing, Bleaching and Sizing Materials.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Corn Products Refining Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Ford Co., J. B.
India Alkali Works.
Kali Mfg. Co.
Keever Starch Co.
Klipstein & Co., A.
Mathieson Alkali Works, Inc.
Metz & Co., H. A.
National Aniline & Chemical Co.
Newport Chemical Works.
Rock Glen Salt Co.
Roessler & Hasslacher Co.
Southern Distributing Co.
Staley Mfg. Co., A. E.
Stearns, Wm. Taylor.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.
Zavon Co., Inc.

Fire Doors and Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.
Seawell, Luke.
Sanymetal Products Co.
Vonnegut Hardware Co.

Fire Hose.
(See Hose—Fire).

Fire Protecting Paint.
(See Paint).

Flexible Couplings.
Cresson-Morris Co.

Flood Lights—Electric.
Crouse-Hinds Co.
General Electric Co.

Flooring—Hardwood.
Hightower Box & Tank Co.
Long Bell Farm Corp.
Southern Cypress Mfg. Co.

Floor Scrubbing Machine.
American Scrubbing Equip. Co.

Floor Scrubbing Powders.
India Alkali Works.

Floor Sweeps.
See Brushes.

Fluted Rolls.
Campbell Mfg. Co.
Howard & Bullough.
Perkins & Son, B. F.
Saco-Lowell Shops.
Schofield & Sons, J. S.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Flyers.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Founders.
Cresson-Morris Co.
Lombard Fdry. & Mch. Works.

Fountains—Drinking.
Crane Co.
Manufacturing Equipment & Engineering Co.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.
Twentieth Century Brass Works.

Friction Clutches.
(See Clutches—Friction)

Fuel.
(See Coal).

Fuel Economizers.
Sturtevant Co., B. F.

Fuses.
(See Elec. Mchy. and Supplies).

Garage Doors and Door Hardware.
Richards-Wilcox Mfg. Co.
Seawell, Luke.

Garnett Machines.
Roy & Son Co., B. S.
Smith & Furbush Mach. Co.

Gas Engines.
(See Engines—Gas).

Gaskets.
Diamond State Fibre Co.

Gauge Cocks.
Lunkenheimer Co.

Gauges—Draft.
Taylor Instrument Co.

Gauges—Mercury Column Vacuum.
Taylor Instrument Co.

Gauge—Oil.
Lunkenheimer Co.

Gauges—Pressure.
Taylor Instrument Co.

Gauges—Recording.
Taylor Instrument Co.

Gauges—Water.
Lunkenheimer Co.

Gears—Silent.
Diamond State Fibre Co.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

Gear Transmission.
Sturtevant Co., B. F.

Gear Cutting and Cutters.
Cresson-Morris Co.
Whitin Machine Co., D. E.

Gear Pullers.
General Electric Co.

Generators—Electric.
(See Motors and Generators).

Glassware and Dishes.
(See Dishes).

Governors—Pump.
General Electric Co.

Graphite Products.
Dixon Crucible Co., Jos.

Grates—Boiler.
International Eng. Works.
Lombard Fdry. & Mch. Co.
Walsh & Weidner Boiler Co.

Grates—Mechanical.
(See Stokers).

Grease.
(See Lubricants).

Grease Cups.
(See Lubricators).

Green Houses.
Hulme, J. S.

Grindstones.
Richards-Wilcox Mfg. Co.

Grinders—Card, Cylinder, Roll, Napper and Garnet.
(See Card Grinding Machinery).

Guards—Electric Lamp.
Flexible Steel Lacing Co.

Guides—Thread.
Palmer Co., I. E.

Guider (Cloth-Electric.)
Blake Electric Mfg. Co.

Gums.
(See Finishing and Sizing Materials).

Guy Anchors.
Crouse-Hinds Co.

Gymnasium Apparatus.
Medart Mfg. Co., Fred.

Hangers.
(See Shafting and Hangers).

Hardware (Building.)
Richards-Wilcox Mfg. Co.
Seawell, Luke.
Sanymetal Products Co.
Vonnegut Hardware Co.

Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Greist Mfg. Co.
Garland Mfg. Co.
Southern Bending Co.

Heads—Bobbin and Spool.
Diamond State Fibre Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus).

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Howard Bros. Mfg. Co.
Steel Heddle Mfg. Co.

Heddle Frames.
Crompton & Knowles Loom Wks.
Steel Heddle Mfg. Co.

Hoists.
Curtis Pneumatic Mchry. Co.
Hulme, J. S.
Link-Belt Company.
Morse Chain Co.
Walraven Co.

Hose—Fire.
Collins, J. D.

Hosiery Dyeing Machinery.
Cocker Mach. & Fdry. Co.
Franklin Process Co.

Hosiery Forms.
(See Drying Forms).

Hosiery Yarns.
(See Yarn Manufacturers).

Hospital Equipment.
Thomas Co., F. H.

Hotels.
Hotel Tuller.
Hotel Martinique.

Houses—Ready-Made.
Seawell, Luke.

Humidifying Apparatus.
American Blower Co.
American Moistening Co.
Carrier Eng. Corp.
Manufacturers Machine Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Humidity Indicating Instruments.
Powers Regulator Co.
Taylor Instrument Co.

Hydraulic Turbines.
(See Turbines—Hydraulic).

Hydro Extractors.
(See Extractors).

Hydrometers.
Taylor Instrument Co.

Hygrometers.
Taylor Instrument Co.

Hygrodeiks.
Taylor Instrument Co.

Indicating and Recording Instruments and Thermometers.
General Electric Co.
Powers Regulator Co.
Taylor Instrument Co.

Indigo.
(See Dyestuffs and Chemicals)

Industrial Relationship Service.
Sherman Service, Inc.

Industrial Sites.
Long Bell Lumber Co.
Nashville Industrial Corp.

Injectors.
Lunkenheimer Co.

Insulation—Vulcanized Fibre.
Diamond State Fibre Co.

Ink—Stencil and Marking.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.
Regnas & Co., J. R.

Iron Work—Ornamental.
Cyclone Fence Co.
Dufur & Co.
Lombard Iron Works & Supply Co.

Jacquards.
Crompton & Knowles Loom Wks.

Jerker Straps.
Augusta Mill Supply Co.

Jute Bagging Machine.
Smith & Furbush Machine Co.

Kettles—Size.
(See Size Kettles).

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleacher Kiers).

Knit Goods Specialties.
Knit Goods Specialty Co.

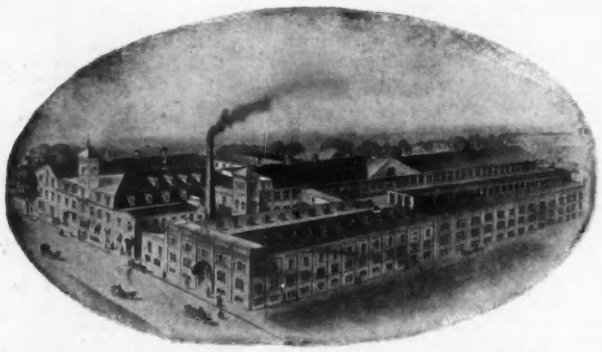
Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers).

Knit Goods Washers.
(See Washers—Cloth).

Knitting Machinery and Supplies.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Marken Machine Co.
Scott & Williams.
Wildman Mfg. Co.

Laboratory Instruments and Thermometers.
Taylor Instrument Co.

Lacing—Belt.
(See Belt Lacing).



Emmons Loom Harness Co.

The Largest Manufacturers of Loom Harness and Reeds in America.

Loom Harness and Reeds

COTTON HARNESS for all kinds of plain and Fancy Weaves in Cotton and Silk Goods.

MAIL HARNESS for Cotton Duck, Worsted, Silk and Woolen Goods.

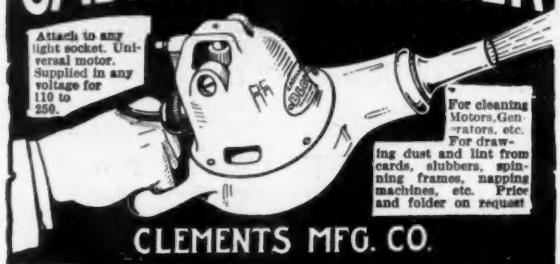
SELVEDGE HARNESS, any depth up to 25 inches, for Weaving Tape Selvedges.

REEDS for Cotton, Woolens, Silk and Duck.

Slasher and Striking Combs, Warper and Leice Reeds, Beamer and Dresser Hecks, Mending Eyes, Jacquard Heddles.

LAWRENCE, - - - - - MASS.

CADILLAC PORTABLE ELECTRIC BLOWER


Attach to any light socket. Universal motor. Supplied in any voltage for 110 to 250.
For cleaning Motors, Generators, etc. For drawing dust and lint from cards, slubbers, spinning frames, napping machines, etc. Price and folder on request

CLEMENTS MFG. CO.
612 FULTON ST. CHICAGO, ILL.

Please Let Us Quote You Price on

Salt

when in the Market

ROCK GLEN SALT CO.
ROCK GLEN, N. Y.

B C
TRADE MARK

BARBER-COLMAN COMPANY

Main Office and Factory

Rockford, Ill.

Boston, Mass. Greenville, S. C.

WARP TYING MACHINES

WARP DRAWING MACHINES

HAND KNOTTERS FOR SPOOLING AND WINDING

Shafts, Pulleys, Hangers, Belting Packing, Lacing

BOILERS

For Mills and Public Works. Low Prices

Tanks, Stacks, Smoke Flues, Boiler Tubes, Pipe, Valves, Fittings, Kerosene and Gasoline Engines, Wood Saws, Pumps, Heaters, Injectors, Engine Supplies and Repairs for Mills, Hotels, Public Works.

Iron and Brass Castings Cast Every Day.

LOMBARD Foundry, Machine, Boiler Works, and Supply Store
AUGUSTA, GEORGIA.

COTTON—WOOL—SILK
DYED or BLEACHED in SKEIN

Fast to Bleaching. Delivered in Skein or Tube.
PROMPT DELIVERIES—RIGHT PRICE
Backed by 18 Years Experience.
Same yardage delivered as received. COUNT YOUR SKEINS.
Your Patronage Solicited.

HABERSHAM KING, JR.
Plant: 4-6 North Butler St., Atlanta, Ga.

STENCILS

FOR COTTON SHIPPERS, COTTON MILLS, MERCHANTS & MANUFACTURERS—ALSO BRUSHES, INK MARKING POTS
RUBBER STAMPS NOTARIAL CORPORATION SEALS
ATLANTA RUBBER STAMP & STENCIL WORKS
OFFICE 33 LUCKIE ST. WORKS 550 EDGEWOOD AVE.
PHONE ASH (LARGEST STENCIL AND STAMP HOUSE IN GEORGIA) ATLANTA, GA.

Tycos

TEMPERATURE INSTRUMENTS
INDICATING-RECORDING-CONTROLLING

Always consistent in performance

Taylor Instrument Companies
ROCHESTER, N. Y.

There is a Tycos or Taylor Temperature Instrument for Every Purpose

(Y)

BUYERS' INDEX—Continued.

Lamps—Incandescent and Arc.
Carter Electric Co.
Cooper Hewitt Electric Co.
Crouse-Hinds Co.
Cutter Works, George.
General Electric Co.
Seawell, Luke
Walraven Co.
Westinghouse Elec. & Mfg. Co.
Westinghouse Lamp Co.

Lamp Guards—Key Locking.
Flexible Steel Lacing Co.

Lamp Reflectors.
Carter Electric Co.
Cooper Hewitt Electric Co.
Crouse-Hinds Co.
Cutter Works, George.
Westinghouse Elec. & Mfg. Co.

Landscape Architects.
(See Village Architects).

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Latches (Fire Exit Self-Releasing.)
Vonnegut Hardware Co.

Laundry Machinery.
American Laundry Mach'y Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.

Lavatories.
Crane Co.
Manufacturing Equipment & Engineering Co.
Vogel Co., Jos. A.

Leather Belting.
(See Belting).

Leather Specialties.
American Supply Co.
Williams & Sons, I. B.

Lights—Flood.
Crouse-Hinds Co.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Linen Yarns.
(See Yarns—Linen).

Link Belting.
(See Belting—Link).

Linters.
(See Waste Dealers).

Liquid Chlorine.
(See Chlorine).

Loaders—Wagon and Truck.
Link-Belt Company.

Locks and Latches.
Richards-Wilcox Mfg. Co.

Lockers—Metal.
Collins, J. D.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

Logwood Extract.
(See Dyestuffs and Chemicals).

Looms.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Saco-Lowell Shops.
Schaum & Uhlinger.
Stafford Co.

Loom Attachments—Automatic.
Draper Corporation.

Loom Harness.
(See Harness).

Lubricants.
Dixon Crucible Co., Jos.
N. Y. & N. J. Lubricant Co.
Swan & Finch Co.
Texas Co.

Lubricators.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.

Lug Straps.
(See Straps—Lug).

Lumber.
Long Bell Lumber Co.
Southern Cypress Mfg. Asso.

Lunch Room Equipment.
(See Restaurant).

Machine Tools.
(See Tools).

Machinists.
Cresson-Morris Co.

Marking Machines.
Marken Machine Co.

Marking Pots, Stencils, Inks, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.

Mercerized Yarns.
(See Yarn Manufacturers).

Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co

Metal Ceilings, Etc.
Dowman, Geo. A.
Lupton's Sons Co., David.

Metals—Perforated.
(See Screens and Sieves).

Metal Workers—Sheet.
Lombard Iron Works & Supply Co.

Meters—Flow, Air, Gas, Electric Steam, Etc.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
General Electric Co.
Taylor Instrument Co.
Westinghouse Elec. & Mfg. Co.

Meters—Revolution.
Taylor Instrument Co.

Mill Baskets and Boxes.
(See Boxes—Mill).

Mill Engineer.
(See Architects and Engineers).

Mill Villages.
(See Villages).

Mill Supplies—Miscellaneous.
(See Supplies—Mill).

Mill White Paint.
(See Paint).

Monorail Conveying Systems.
Richards-Wilcox Mfg. Co.

Mops.
Atlanta Brush Co.
Harris Broom Co.
Southern Brush & Broom Co.
Southwestern Broom Mfg. Co

Motors and Generators—Electric.
Allis-Chalmers Mfg. Co.
Carter Electric Co.
General Electric Co.
Hulme, J. S.
Nashville Industrial Corp.
Sturtevant Co., B. F.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co.

Moving Picture Mch. & Supplies.
(See Theatre Equipment).

Nails—Cement Coated.
Lovingood Co.

Nappers.
Roy & Son Co., B. S.

Napper Clothing.
Howard Bros. Mfg. Co.

Office Partitions.
Sanymetal Products Co.

Oils.
Johnson & Co., Inc., Oliver.
Southern Cotton Oil Co.
Wadsworth, Howland & Co., Inc.

Oils—Finishing.
(See Finishing and Sizing Materials).

Oils—Lubricating.
(See Lubricants).

Oil Cups.
(See Lubricators).

Oil Paper.
Bradley Mfg. Co., A. J.

Oiling Devices.
(See Lubricators).

Openers for Cotton, Wool, Waste, Etc.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Overhead Carriers.
Dowman, George.

Oxidizing Machinery.
Cocker Mch. & Fdry. Co
Salem Iron Works.
Phila. Drying Machinery Co.

Oxygen.
Commercial Acetylene Supply Co.
Standard Gas Products Co.
Southern Welding Co.

Packing Boxes & Cases—Wooden.
Hightower Box & Tank Co.
National Asso. of Box Mfgrs.
Waiko Box Co., Inc.

Packings.
Augusta Mill Supply Co.
Walraven Co.

Paint.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co., The.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Southern Distributing Co.
Tropical Paint & Oil Co.
Wadsworth, Howland & Co., Inc.

Painting Contractors.
(See Contractors.)

Panel Boards.
(See Switchboards).

Paper.
Bradley Mfg. Co., A. J.
Diamond State Fibre Co.

Partitions (Office and Toilet).
Lyon Metallic Mfg. Co.
Sanymetal Products Co.

Perforated Metal.
(See Screens and Sieves).

Partitions—Steel.
Dowman, Geo.
Lupton's Sons Co., David

Peroxides.
Roessler & Hasslacher Chemical Co.

Pickers—Curled Hair.
Schofield Co., Wm.
Smith & Furbush Mach. Co.

Pickers—Leather.
Augusta Mill Supply Co.
Garland Mfg. Co.

Picker Sticks.
Augusta Mill Supply Co.
Garland Mfg. Co.
Southern Bending Co.
Shambow Shuttle Co.
Walraven Co.

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Pinions.
Diamond State Fibre Co.
General Electric Co.

Pipe and Pipe Fittings.
Crane Co.
Lunkenheimer Co.
Parks-Cramer Co.
Scaife & Sons Co., Wm. B.
Walraven Co.

Pipe Threading and Cutting Machines.
Walraven Co., The.

Playground Apparatus Equipment.
Crane Co.
Hill-Standard Co.
Manufacturing Equipment & Engineering Co.
Puro Sanitary Drinking Fountain Co.
Taylor, Halsey W.
Twentieth Century Brass Works.

Pneumatic Collecting & Conveying Systems.
Sturtevant Co., B. F.

Pneumatic Machinery & Tools.
Curtis Pneumatic Mchry. Co.

Portable Conveyors.
(See Conveyor.)

Power (Electric.)
Georgia Railway & Power Co.

Power Transmission.
Aldrich Mach. Works.
Allis-Chalmers Mfg. Co.
Augusta Mill Supply Co.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Fafnir Bearing Co.
General Electric Co.
Hyatt Roller Bearing Co.
Lewellen Mfg. Co.
Link-Belt Company.
Manufacturing Equipment & Engineering Co.
Morse Chain Co.
Russell Mfg. Co.
S K F Industries.
Slaughter Mchry. Co., G. G.
Transmission Ball Bearing Co.
U. S. Ball Bearing Co.
Walraven Co., The.
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.
Wood's Sons Co., T. B.

Pressed Steel.
Lupton's Sons Co., David.

Presses.
American Laundry Mchry. Co.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Famous Mfg. Co.
Galland-Henning Mfg. Co.
Lovingood Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co., The.

Pulleys.
Augusta Mill Supply Co.
Cresson-Morris Co.
Diamond State Fibre Co.
Link-Belt Company.
Walraven Co., The.
Wood's Sons Co., T. B.

Pulley Covering.
Williams & Sons, I. B.

Pumps.
Allis-Chalmers Mfg. Co.
Sydnor Pump & Well C., Inc
Toomey, Frank.
Walraven Co.
Walsh & Weidner Boiler Co., The.
Westinghouse Elec. & Mfg. Co.

Pump Valves.
(See Valve Discs).

Psychrometers—Sling.
Taylor Instrument Co.

Pyrometers.
Taylor Instrument Co.

Quill Cleaning Machines.
Terrell Machine Co.
Dufur & Co.

Railroads.
Southern Railway.

Receptacles—Fibre.
(See Fibre Products).

Recording Instruments.
Boston Machine Works.
General Electric Co.
Powers Regulator Co.
Service Recorder Co.
Taylor Instrument Co.

Recorders (Machine Service Time).
Service Recorder Co.

Recorders—Temperature.
Taylor Instrument Co.

Reeds.
American Supply Co.
Emmons Loom Harness Co.
Southern Bending Co.
Shambow Shuttle Co.
Walraven Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield Co., Wm.
Whitin Machine Works.

Reflectors—Lamp.
(See Lamp Reflectors).

Regulators—Liquid Level.
General Electric Co.

Regulators—Pressure.
General Electric Co.
Taylor Instrument Co.

Regulators—Temperature.
(See Temperature Controllers).

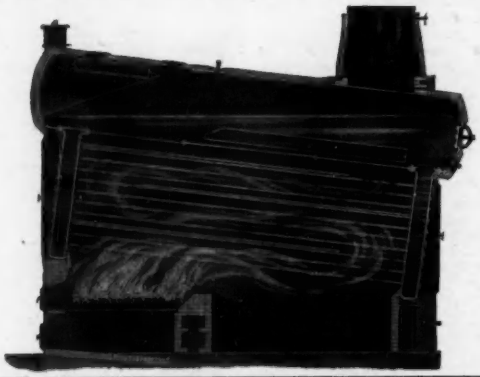
Reinforcing Slag.
Birmingham Slag Co.

Repairing—Electrical.
Westinghouse Elec. & Mfg. Co.

Repairing—Textile Machinery, Etc.
Autogenous Welding Co.
General Machine Works.
Osler & Co., W. B
Southern Spindle & Flyer Co.
Southern Welding Co.
Standard Gas Products Co.

Restaurant Equipment.
Sanymetal Products Co.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.



TUBULAR **BOILERS** WATER TUBE

STEEL CASINGS — TOWERS — TANKS

Our IMPROVED STEEL CASINGS fitted to your Boilers will save you from 10% to 25% in fuel.

WRITE FOR OUR NEW CATALOGS

THE WALSH & WEIDNER BOILER CO.

CHATTANOOGA, TENN.

NEW YORK SAN FRANCISCO NEW ORLEANS MEMPHIS HAVANA JACKSONVILLE

Liquid EBG Chlorine

Our container equipment includes 100 and 150 pound Cylinders, Ton Drums, and Tank Cars.

Electro Bleaching Gas Co.

PIONEER MANUFACTURERS of LIQUID CHLORINE

Plant: NIAGARA FALLS, N.Y.

Main office 18 East 41st Street New York. *Chicago office* 11 So. La Salle St.

FAFNIR

Ball Bearings

all standard types & sizes

FAFNIR Double Ball Bearing Hanger Boxes.

THE FAFNIR BEARING COMPANY

Consol Patent Licensee

New Britain, Conn.

CHICAGO NEW YORK, DETROIT CLEVELAND

Schofield Patent Automatic Opener and Duster

For opening and dusting Wool, Cotton, Linters, Hair and kindred fibrous substances.

"Schofield" intermediate feeds for Cards, Wool, Rag, Waste, Hair and Lumper Pickers, Automatic, Cone and Oldham Willows, Rag and Extract Dusters, Waste Pullers, Blamaine Lap Feeds, Curled Hair Pickers, Needle Looms, etc.

WILLIAM SCHOFIELD COMPANY

Iron Founders, Textile Machinery Builders.

Krams Ave., Manayunk, Philadelphia, Pa.

COAL

HIGH GRADE

KENTUCKY, TENNESSEE AND ALABAMA

STEAM, GAS,

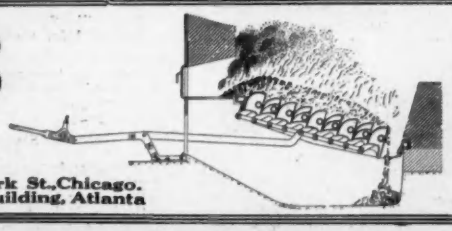
DOMESTIC, SMITHING

FURNACE AND FOUNDRY COKE

UNITED STATES FUEL CORPORATION

CHATTANOOGA, TENN.

COKAL HAND STOKERS



Hundreds of satisfied users report saving of fuel and increased boiler capacity.

Write for Catalog.

COKAL STOKER CORPORATION, 1017 N. Clark St., Chicago. 517 Hurt Building, Atlanta

FAMOUS MANUFACTURING CO.

COTTON
COTTON WASTE
COTTON SEED HULLS
RAGS, PAPER,
ETC.

MANUFACTURERS OF "FAMOUS" AND "CHAMPION"

BALING PRESSES

FOR ALL PURPOSES

140 MAIN STREET EAST CHICAGO, IND.

SCRAP METALS
WOOD SHAVINGS
SAW DUST
EXCELSIOR
CURLED HAIR ETC

BUYERS' INDEX—Continued.

Ring Travelers—Steel and Bronze.
Whitinsville Spinning Ring Co.
Whitin Machine Works.

Rings—Spinning.
(See Spinning Rings).

Rocker Shaft Bearings.
(See Bearings).

Rolls—Calender.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Roy & Son Co., B. S.
Textile Finishing Machinery Co.

Rolls—Rubber Covered.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Textile Finishing Machinery Co.

Rolls—Steel.
Butterworth & Sons Co., H. W.
Campbell Mfg. Co.
Southern Spindle & Flyer Co.
Textile Finishing Machinery Co.

Rolls—Top.
Campbell Mfg. Co.

Roll Repairing.
Osler & Co., W. B.

Roofing.
American Roofing & Paint Co.
Barrett Co., The.
Cortright Metal Roofing Co.
Dowman, George.
Peaslee-Gaulbert Co., Inc.
Wadsworth, Howland & Co.
Walraven Co.

Roof and Cement Coating.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co.
Dixon Crucible Co., Jos.
Du Pont de Nemours & Co., E. I.
Johnson & Co. Inc., Oliver.
Patterson-Sargent Co.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Tropical Paint & Oil Co.
Wadsworth, Howland & Co

Rope—Transmission.
Cresson-Morris Co.
Link-Belt Company.
Walraven Co.

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Rubber Stamps.
(See Stamps, Stencils, Etc)

Salt.
Ruck Glen Salt Co.

Sanitary Products.
Crane Co.
Manufacturing Equipment & Engineering Co.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Sanitas Co.
Taylor, Halsey W.
Thomas Co., F. H.
Vogel Co., Jos. A.

Sash-Window—Steel.
Dowman, Geo.
Lupton's Sons Co., David.
Seawell, Luke.

Scales.
Lovingood Co.

Scale Preventer—Boiler.
(See Boiler Feed Water Purification).

Schools.
Philadelphia Textile School.

Screens (Moving Picture).
Monarch Theatre Supply Co.

Screens and Sieves—Perforated.
Erdle Perforating Co.
Link-Belt Company.

Scouring Machinery.
(See Washers (Cloth)

Scrubbing Machine—Floor.
American Scrubbing Mch. Co.

Scrubbing and Washing Powders.
India Alkali Works.
Mathieson Alkali Works.

Second Hand Machinery and Supplies.
Nashville Industrial Corp.
Toomey, Frank, Inc.
Walraven Co.

Sewing Machines.
Merrow Machine Co., The.
Textile Finishing Machinery Co

Shades—Electric Lamp.
(See Reflectors).

Shafting and Hangers.
Augusta Mill Supply Co.
Cresson-Morris Co.
Fafnir Bearing Co.
Link-Belt Co.
S K F Industries.
Walraven Co., The.
Wood's Sons Co., T. B.

Shears.
Roy & Sons Co., B. S.

Shelving—Sectional Steel.
Collins, J. D.
Dowman, George
Hyatt Roller Bearing Co.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.
Seawell, Luke.
Vonnegut Hardware Co.

Shingles—Asphalt.
Barrett Co.

Shingles—Metal.
Cortright Metal Roofing Co.
Dowman, George

Shingles—Wood.
Southern Cypress Mfg. Asso.

Shipping Room Machinery and Supplies.
Atlanta Stamp & Stencil Works
Bradley Mfg. Co., A. J.
Collins, J. D.
Diamond State Fibre Co.
Handy Equip. Corp.
Hightower Box & Tank Co.
Hulme, J. S.
Lane & Bro., W. T.
Lovingood Co.
Standard Fibre Co.
Signode System, Inc.
Walraven Co., The.
Walke Box Co., Inc.

Shower Baths and Cabinets.
Crane Co.
Sanymetal Product sCo.

Shuttles.
Crompton & Knowles Loom Wks
Draper Corporation.
Shambow Shuttle Co.
Southern Bending Co.
Walraven Co.

Singeing Machinery.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

Sites for Factories. (See Industrial Sites.

Size Box Temperature Controller.
Powers Regulator Co.
Taylor Instrument Co.

Size Kettles.
Butterworth & Sons Co., H. W.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

Sizing and Finishing Compounds.
(See Finishing and Sizing Materials).

Skewers.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.

Skylights—Rolled Steel.
Dowman, George.
Lupton's Sons Co., David.
Seawell, Luke

Slag for Concrete.
Birmingham Slag Co.

Slashers and Slasher Room Supplies.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Howard & Bullough.
Lovingood Co.
PickensSlasher Hood Co., R. O.
Saco-Lowell Shops.
Salem Iron Wks.
Textile Finishing Machinery Co., The.

Slasher Tape.
(See Tape—Slasher).

Slate Asphalt Roofing.
Barrett Co.

Sliding Partition Hardware.
Dowman, George.
Richards-Wilcox Mfg. Co.
Sanymetal Product sCo.
Seawell, Luke.
Vonnegut Hardware Co.

Slubbers.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Soap—Textile.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
India Alkali Co.
Kali Mfg. Co.
Klipstein & Co., A.
Mathieson Alkali Works, Inc.
Newport Chemical Works.
Stearns, Wm. Taylor.
United Chemical Products Corp.
Warren Soap & Mfg. Co.
Wolf & Co., Jacques.

Soda (Textile, Soda Ash and Boiling.)
Klipstein & Co., A
Mathieson Alkali Works, Inc.

Softeners—Cotton.
Arabol Mfg. Co.
Arnold, Hoffman & Co
Borne, Scrymser Co.
Bosson & Lane.
Ciba Co., Inc.
Du Pont de Nemours & Co., E. I.
Ford Co., J. B.
Grasselli Chemical Co.
Kali Mfg. Co.
Klipstein & Co., A.
Mathieson Alkali Works, Inc.
Newport Chemical Works.
Roessler & Hasslacher Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques.
Zavon Co., Inc.

Softeners—Water.
(See Water Softeners).

Solderless Connectors—Frankel.
Westinghouse Elec. & Mfg. Co

Solvents.
(See Finishing).

Spindles.
Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co
Whitin Machine Works.

Spinners.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Fletcher Works.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Commn. Co
Myrtle Mills, Inc.
Parkdale Mills, Inc.

Spinning Frames.
American Machine Co., H. & B.
Crompton & Knowles Loom Wks.
Howard & Bullough.
Schaum & Uhlinger.
Saco-Lowell Shops.
Whitin Machine Works.

Spinning Rings.
Draper Corporation.
Howard & Bullough.
Greenville Spool & Mfg. Co
Greist Mfg. Co.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

Spinning Tape Specialists.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Campbell Mfg. Co.
Knit Goods Specialty Co.

Spooling Machinery.
Draper Corporation.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Spools and Skewers.
Greenville Spool & Mfg. Co.
Shambow Shuttle Co.
Walraven Co.

Sprinkler Tanks.
(See Tanks, Towers, Etc.).

Sprockets.
Link-Belt Company.
Morse Chain Co.

Stamps, Stencils and Stencil Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.

Stand Pipes.
(See Tanks, Towers, Etc.).

Starch and Gums.
(See Finishing and Sizing Materials).

Steam Engines.
(See Engines—Steam).

Steam Hose.
(See Hose—Fire.)

Steam Pumps.
(See Pumps—Steam).

Steam Traps.
(See Traps—Steam).

Steel Shelving, Doors, Window Partition, Etc)
Dowman, George.
Lupton's Sons Co., David.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.
Seawell, Luke.

Steel Lockers.
Lyon Metallic Mfg. Co.
Seawell, Luke.

Stencils and Stencil Papers.
(See Stamps and Stencils).

Stencil Brushes.
(See Marking Pots and Brushes).

Stencil Cutting Machines.
Atlanta Stamp & Stencil Works.
Bradley Mfg. Co., A. J.
Lovingood Co.

Sticks (Picker).
See Picker Sticks.

Stop Motion.
Crompton & Knowles Loom Wks.
Draper Corporation.
Eclipse Textile Devices, Inc.
Hunt Automatic Stop Motion, Inc.
Whitin Mch. Wks.
Wildman Mfg. Co.

Stokers.
Cokal Stoker Co.
Detroit Stoker Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Storage Racks.
(See Shelving).

Straps—Lug.
Augusta Mill Supply Co.
Garland Mfg. Co.

Strapping.
(See Leather Specialties or Band Strapping).

Street Lighting Fixtures.
Cutter Works, George.

Supplies—General Mill.
Augusta Mill Supply Co.
Hulme, J. S.
Howard Bros. Mfg. Co.
Lyon Metallic Mfg. Co.
Nashville Industrial Corp.
Regnas & Co., J. R.
Slaughter Machinery Co., G G.
Southern Distributing Co
Steel Heddle Mfg. Co.
Walraven Co., The.

Switches—Knife-Elec.
Crouse-Hinds Co.
Cutter Works, George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Switchboards—Panel.
Crouse-Hinds Co.
Cutter Co., George.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Tables, Chairs, Etc.
Hill-Standard Co.
Manufacturing Equipment & Engineering Co.

Tag Addressing Machines.
Lovingood Co.

Tallow.
(See Finishing Materials).

Tanks and Tubs.
Hightower Box & Tank Co.
Lombard Iron Works & Supply Co.
Permutit Co.
National Asso. of Box Mfgrs.
Phila. Drying Machinery Co.
Salem Iron Wks.
Textile Finishing Machinery Co., The.
Walsh & Weidner Boiler Co.

VOGEL

PATENTED

Frost Proof Closets

350,000 giving satisfaction. Save Water; Require no Pit; Simple in the extreme. The most durable water closet made. In service winter and summer.

No. 1

Enameled Roll flushing rim bowls.

Heavy brass valves.

Strong hardwood seat.

Galvanized tank.

Malleable seat castings will not break.

Tested under hydraulic pressure before leaving factory.

ASK YOUR JOBBER

JOSEPH A. VOGEL CO.
WILMINGTON
DELAWARE

HOW PENNIES
PROTECT YOUR DOLLARS

—is the title of a little booklet that every executive in the Textile Feld should read. It will be mailed free upon request.

THE TROPICAL PAINT & OIL COMPANY

CLEVELAND, OHIO

"The Firm that Serves With What Preserves."

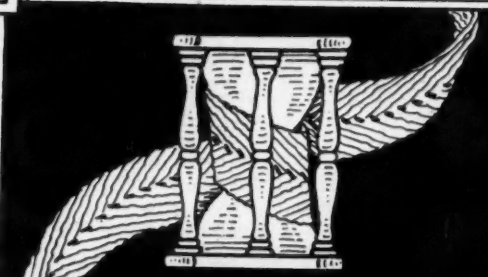
AUGUSTA MILL SUPPLY CO.

Textile Machinery

General Mill Supplies

Transmission and Power Apparatus

429 JACKSON ST. AUGUSTA, GA.



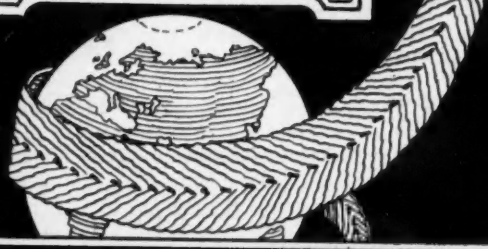
The Test of Time

WHEN tape drive was first applied to cotton frames, Barber Tapes were the ones that were held up and selected by engineers as the best. The reason was that Barber Tapes were designed with the proper weight and construction to get maximum spindle speed and maximum service.

Since that time there have been many kinds of tape placed on the market, yet Barber still maintains that enviable reputation established years ago.

We carry extensive stocks and a wire to us at our expense brings service that is swift and sure. Write or wire for prices.

BARBER MFG. CO.,
Lowell, Mass.
Spinning Tape Specialists.



BARBER
Spinning & Twisting
TAPES

BUYERS' INDEX—Continued.

Tapes and Braids.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Knit Goods Specialty Co.
Weimar Brothers.

Tape Looms—Cotton.
Fletcher Works.
Schaum & Uhlinger.

Tape—Slasher.
Lovingood Co.

Tapes—Spinning and Twisting.
Barber Mfg. Co.
Knit Goods Specialty Co.

Tape Making Machines.
(See Bandage and Tape Mach.)

Telephones—Calling System.
Carter Electric Co.

Temperature Controllers.
Carrier Eng. Corp.
General Electric Co.
Parks-Cramer Co.
Powers Regulator Co.
Sturtevant Co., B. F.
Taylor Instrument Co.

Temples.
Draper Corporation.

Tenters.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

Tenter Frame Guider (Electric).
Blake Electric Mfg. Co.

Textile Machinery.
(See Cotton Mill Machinery).

Theatre Equipment.
Monarch Theatre Supply Co.

Thermometers—All Kinds.
Taylor Instrument Co.

Thin Place Preventers.
Draper Corporation.

Thread Guides.
Palmer Co., The I. E

Time Clocks.
(See Clocks.)

Tiering Machines.
Collins, J. D.
Lovingood Co.

Ties—Baling.
(See Bale Ties).

Toilets.
Crane Co.
Manufacturing Equipment & Engineering Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Toilet Partitions.
Lupton's Sons Co., David.
Sanymetal Products Co.

Tool Cabinets—Steel.
Lupton's Sons Co., David
Lyon Metallic Mfg. Co.

Tool Stands—Steel.
Lupton's Sons Co., David
Lyon Metallic Mfg. Co.

Tools—All Kinds.
Walraven Co., The.

Top Flats Reclothed.
Howard Bros. Mfg. Co.

Towers.
(See Tanks and Towers).

Tractors—Electric, Industrial.
Collins, J. D.

Transmission—Power.
(See Power Transmission Machinery).

Traps—Return Steam.
American Blower Co.
Morehead Mfg. Co
Sturtevant Co., B. F.

Trucks—Auto.
Packard Motor Car Co.
White Co.

Trucks, Baskets, Etc., Canvas.
Lane & Bro., W. T.

Trucks—Electric—Inter.
Collins, J. D.

Trucks—Hand and Elevating.
Collins, J. D.
Handy Equip. Corp.
Hulme, J. S.
Lovingood Co.

Trucks—One Man.
Handy Equip. Corp.

Trucks—Fibre—Inter, Etc.
Diamond State Fibre Co.
Standard Fibre Co.

Tubes—Cloth.
Diamond State Fibre Co.

Turbines (Hydraulic).
Allis-Chalmers Mfg. Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Turbines—Steam.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Twisting Machinery and Supplies.
Barber Mfg. Co.
Draper Corporation
Howard & Bullough.
Knit Goods Specialty Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Urinals.
Crane Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Unions—Bronze.
Crane Co.
Lunkenheimer Co.

Vacuum Cleaning System for Mills.
Sturtevant Co., B. F.

Vacuum Pans.
Cresson-Morris Co.

Valves—Angle, Globe, Cross, Blow-off, Check, Gate, Pop-Safety, etc.).
Crane Co.
Lunkenheimer Co.

Valves—Non-return Stop.
Crane Co.
Lunkenheimer Co.

Variable Speed Transmission.
Lewellen Mfg. Co.

Varnishes.
American Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Tropical Paint & Oil Co.
Wadsworth, Howland & Co., Inc.

Ventilating Apparatus.
American Blower Co.
Carrier Eng. Corp.
General Electric Co.
Parks-Cramer Co.
Sargent's Sons Co., C. G.
Seawell, Luke.
Sturtevant Co., B. F.
Tolhurst Machine Co.

Vises and Benches.
Richards-Wilcox Mfg. Co.

Village Architects and Designers.
Lockwood, Green & Co.
Sirrine, J. E.
Spiker & Lose.

Village Houses.
(See Houses—Ready-Built).

Wagon and Car Unloaders.
Curtis Pneumatic Mchry. Co.

Warehouse—Portable.
(See Buildings).

Warehouse Door Hardware.
(See Doors and Hardware).

Warp Drawing Machine.
Cocker Machine & Fdry. Co.
Crompton & Knowles Loom Wks.

Warpers and Warping Machinery.
Cocker Mch. & Fdry. Co.
Draper Corporation.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.

Wash Basins.
(See Lavatories).

Washers—Cloth.
American Laundry Machinery Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Fdry. Co.
Klauder-Weldon Dyeing Mch. Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Tolhurst Mch. Wks.

Washers.
Diamond State Fibre Co.

Washing Powders (Floor).
India Alkali Works.

Waste Bins—Steel.
Lupton's Sons Co., David.

Waste Machinery—Cotton.
Howard & Bullough.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Co.

Watchman Clocks.
(See Clocks—Watchman).

Water Coolers—Fountain).
Crane Co.
Manufacturing Equipment & Engineering Co.
Puro Sanitary Drinking Fountain Co.
Rundle-Spence Mfg. Co.
Taylor, Halsey W.
Twentieth Century Brass Works.

Water Columns.
Lunkenheimer Co.

Water Softeners & Purifiers.
American Water Softener Co.
Hulme, J. S.
Norwood Engineering Co.
Permutit Co.
Scaife & Sons Co., Wm. B.

Water Supply System.
Sydnor Pump & Well Co., Inc

Water Towers.
(See Tanks and Towers).

Waterproofing Machinery.
Butterworth & Sons Co., H. W.
Textile Finishing Machinery Co., The.

Weaving.
(See Yarn Manufacturers).

Welding Apparatus—Electric Arc.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Welding Apparatus and Supplies—Oxy-Acetylene.
Commercial Acetylene Supply Co.
Southern Welding Co.
Standard Gas Products Co.

Welding—Job.
Autogenous Welding Co.
Southern Welding Co.
Standard Gas Products Co.

Welfare Architects.
(See Village Architects).

Welfare Equipment.
Crane Co.
Cutter Works, George.
Hill Standard Co.
Lyon Metallic Mfg. Co.
Manufacturing Equipment & Engineering Co.
Monarch Theatre Supply Co.
Puro Sanitary Drinking Fountain Co.
Sanitas Co.
Taylor, Halsey W.
Thomas Co., F. H.
Twentieth Century Brass Works.
Westinghouse Elec. & Mfg. Co.

Well Drilling.
Robbins, J. E.
Sydnor Pump & Well Co., Inc.

Wheels—Fibre.
(See Fibre Products).

Wheel Puller.
General Electric Co.

Whistles—Steam.
Crane Co.
Lunkenheimer Co.

Whizzers.
Tolhurst Mch. Wks.

Winders.
Firsching, J. A.
Howard & Bullough, American Machine Co.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Universal Winding Co.

Window Frames & Sash—Steel.
Dowman, George.
Lupton's Sons Co., David
Seawell, Luke

Window Sash—Steel.
Dowman, George.
Lupton's Sons Co., David.
Seawell, Luke.

Wires—Drop.
(See Drop Wires).

Wiring Conduits and Fittings.
See Electric Conduits.

Wiring—Elecrical.
(See Electrical Contracters).

Wood.
(See Lumber).

Wood Boxes.
(See Packing Cases.)

Wood Preserver.
Armstrong Roofing & Paint Co.
Atlantic Drier & Varnish Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Johnson & Co., Inc., Oliver.
Peaslee-Gaulbert Co., Inc.
Southern Cotton Oil Co.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.

Wood Pulleys.
(See Pulleys).

Woodworkers' Benches and Vises.
Richards-Wilcox Mfg. Co.

Woolen Machinery.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Wks.
Schofield Co., Wm.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Smith & Furbush Mach. Co.
Textile Finishing Machinery Co.
Whitin Machine Works.

Yarn Manufacturers.
American Yarn & Processing Co.
Arkray Mills, Inc.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Florsheim, H. A.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.
Weimar Bros.

Yarn Dealers & Comm. Merchants.
(See Cotton Yarn and Cloth Commission Merchants and Dealers).

Yarn Dyers.
(See Dyers).

Yarn Testers.
Scott & Co., Henry L.

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

MANUFACTURERS OF
Loom Harness,
Weaving Reeds,
Oak Tanned Leather
Belting, Strapping
Etc.

We make a specialty of Harness for Warp Drawing Machines

NOTE—No orders too large for our capacity.
None too small to receive careful attention.

UNIVERSAL WINDING COMPANY
TEXTILE WINDING MACHINES
LEESONA

An Atlanta Office
in charge of
Winthrop S. Warren
has been opened at
1121 Candler Building

Frederick Jackson,
SOUTHERN AGENT,
Box 523. Charlotte, N. C.

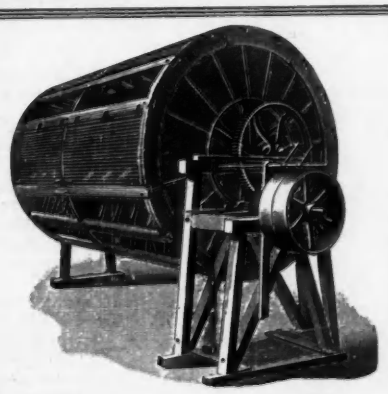
BOSTON, U.S.A.
PROVIDENCE, R.I. NEW YORK CHARLOTTE, N.C.
PARIS MANCHESTER BOMBAY

Spiker & Lose
ENGINEERS

Reports, estimates, appraisals, plans, supervision and consultation on all classes of reinforced concrete, steel and timber structures. Specialty — mills, warehouses, industrial and hydro-electric developments.

519-20 Forsyth Bldg., Atlanta, Ga.

DYE HOUSE MACHINERY
Oxidizers are built with spur gear and also with worm gear drive. Also makers of Dye Machines, Oxidizers, Tom-Toms, and dye house machinery, to specifications.
Write us.
SALEM IRON WORKS,
Winston-Salem, N. C.



ALL STEEL ECONOMY FIRE PROOF **BALING PRESSES**
ALL SIZES FOR ALL PURPOSES
LARGEST LINE BUILT IN U.S.A.
ECONOMY BALER CO., DEPT C ANN ARBOR, MICH., U.S.A.

WATER
WE-FU-GO AND SCAIFE
PURIFICATION SYSTEMS
SOFTENING & FILTRATION
FOR BOILER FEED AND
ALL INDUSTRIAL USES
WM. B. SCAIFE & SONS CO. PITTSBURGH, PA.

Advertisers' Index

Aldrich Machine Works 271
Allis-Chalmers Mfg. Co.....275
American Audit Co. 278
American Blower Co..... *
American Laundry Mchry. Co..247
American Machine Co., H. & B.769
American Moistening Co. ..... *
American Roofing & Paint Co..281
American Scrubbing Equipment Co. 12
American Supply Co. 295
American Textile Banding Co., Inc. 245
American Water Softener Co..250
American Yarn & Processing Co. 262
Arabol Mfg Co. 297
Arkray Mills, Inc. 277
Arlington Cotton Mills 277
Arnold Hoffman & Co. 258
Arrow Mills, Inc. 277
Atlanta Brush Co. 265
Atlanta National Bank 279
Atlanta Rubber Stamp & Stencil Works 289
Atlantic Drier & Varnish Co. *
Augusta Mill Supply Co. 293
Autogenous Welding Co. 276

Barber-Colman Co. 289
Barber Mfg. Co. 293
Barrett Co., The 767
Beer Co., H. & B. 278
Birmingham Slag Co. ..... *
Blake Electric Mfg. Co. ..... *
Borne, Scrymser Co. 260
Bosson & Lane 262
Boston Machine Works Co...782
Bradley Mfg. Co., A. J.....245
Brinton Co., H. 796
Butterworth & Sons Co., H. W.246

Campbell Mfg. Co. ..... *
Carlyle-Johnson Machine Co.....287
Carrier Engineering Corp. 297
Carter Electric Co. 275
Carver-Beaver Yarn Co. 278
Chicago Watchman's Clock Works 788
Ciba Co., Inc. 256
Citizens & Southern Bank 279
Classified Opportunities 282 &283
Clements Mfg. Co. 289
Cocker Machine & Foundry Co.252
Cokal Stoker Co. 291
Cold Springs Textile Corp..... *
Collins, J. D. 297
Commercial Acetylene Supply Co. 782
Cooper Hewitt Electric Co. .. *
Corn Products Refining Co. ..261
Cortright Metal Roofing Co. ..297
Crane Co. 21
Cresson-Morris Co. 274
Crompton & Knowles Loom Works 6
Crouse-Hinds Co. 28
Curtis Pneumatic Mchry. Co... 13
Cutter Works, George ..... *
Cutts Co., E. A. 281
Cyclone Fence Co. 299

Davis, Roger W. 8
Diamond State Fibre Co. 265
Dixon Crucible Co., Joseph ..784
Dowman, George.....297
Draper Corporation 3
Dufur & Co. 281
Du Pont de Nemours Co., E. I.253

Eclipse Textile Devices 12
Economy Baler Co. 295
Electro Bleaching Gas Co.....291
Emmons Loom Harness Co....289
Ernst & Ernst 774

Fafnir Bearing Co. 291
Famous Mfg. Co. 291
Fawcett, Hughes 277
Firsching Co., J. A. 800
Flexible Steel Lacing Co. 273
Fletcher Works 264
Flint Mfg. Co. 277
Florsheim, H. A. 277
Fonda Organization, The E. A. *
Ford Co., J. B. 256
Foundation Co., The 27
Franklin Process Co. ..... *

Galland-Henning Co. 788
Garland Mfg. Co. 784
General Electric Co. ..... *
General Machine Works 800
Georgia Railway & Power Co.770
Goode Construction Co.....282
Grasselli Chemical Co. 260
Gray Mfg. Co. 277
Greenville Spool Mfg. Co..... *
Greist Mfg. Co. 7
Gude & Co. 281

Handy Equipment Co. ..... *
Harris Broom Co. ..... *
Hearne System ..... *
Hemphill Mfg. Co. 794
Hightower Box & Tank Co....270
Hill Standard Co. ..... *
Hotel Martinique 280
Hotel Tuller 280
Howard Bros. Mfg. Co. 10
Howard & Bullough Mach. Co.769
Hulme, J. S. 245
Hunt Automatic Stop Motion, Inc. ..... *
Hunter Mfg. & Comm. Co. ..... *
Huntington & Guerry, Inc. ... *
Hyatt Roller Bearing Co..... 30

India Alkali Works 788
International Eng'g Works ... 22
International Textile Exposition 14

Johnson & Co., Oliver 26
Jordan Mfg. Co. 245

Kali Mfg. Co. 258
Keever Starch Co. 260
King, Jr., Habersham 289
Klauder-Weldon Dyeing Mach. Co. 252
Klipstein & Co., A. 254
Knit Goods Specialty Co. 782

Lane & Bros., W. T. 264
Lewellen Mfg. Co. 784
Lewis, John D. 245
Link-Belt Co. 18
Lockwood, Greene & Co.....272
Lombard Iron Works 289
Long Bell Lumber Co..... 25
Lovingood Co., The ..... *
Lowell Crayon Co. 297
Lunkenheimer Co. 11
Lupton's Sons Co., David ...297
Lyon Metallic Mfg. Co.....788

Manufacturers Machine Co...251
Manufacturing Equipment & Engineering Co. 263
Markem Machine Co. 267
Marshall Co., H. Newton.....271
Mathieson Alkali Works, Inc..255
Merrow Machine Co. 796
Metz Co., H. A. 257
Monarch Theatre Supply Co... *
Monroe Calculating Machine Co. *
Morehead Mfg. Co. 276
Morse Chain Co. 20
Myrtle Mills, Inc. 277

Nashville Industrial Corporation 283
National Aniline & Chemical Co. 1
National Association of Box Manufacturers ..... *
National Bank of Commerce In New York 278
National Shawmut Bank 9
New York & N. J. Lub. Co. ..273
Newport Chemical Co. 776
Norwood Engineering Co. 252

Osler & Co., W. B. 282

Packard Motor Car Co. ..... *
Palmer Co., I. E. 266
Parks-Cramer Co. 4
Parkdale Mills, Inc. 277
Pearson, Jos. T. 800
Peaslee-Gaulbert Co. ..... *
Permutit Co. 251
Phila. Drying Mchry Co.....254
Philadelphia Textile School ...285
Pickens Sasher Hood Co., R. O.248
Powers Regulator Co. 248
Proctor & Schwartz, Inc. 254
Puro Sanitary Drinking Fountain Co. 268

Reliance Machine Works 796
Richards-Wilcox Mfg. Co. 270
Robbins & Sons, J E. 281
Robert & Co. ..... *
Rock Glen Salt Co. 289
Roessler & Hasslacher Chemical Co. 786
Roy & Sons Co., B. S. 6
Rundle-Spence Mfg. Co. 266
Russell Mfg Co. 780

Saco-Lowell Shops 8
Salem Iron Works 295
Sanitas Co. ..... *
Sanymetal Products Co. 269
Sargent's Sons Corp., C. G...250
Scaife & Sons, Wm. B. 295
Schaum & Uhlinger 264
Schofield Sons Co., J. S. 276
Schofield Co., Wm. 291
Scott & Co., Henry L. 776
Scott & Williams 791
Seawell, Luke 300
Service Recorder Co. ..... *
Shambow Shuttle Co. 784
Signode System, Inc. 270
Sirrine, J. E. ..... *
S K F Industries 15
Slaughter Machinery Co., G. G. ..... *
Smith & Furbush Machine Co.263
Southern Bending Co. 8
Southern Brush & Broom Co...268
Southern Cotton Oil Co. ..... *
Southern Cypress Mfg. Asso. .. 23
Southern Distributing Co.....256
Southern Railway System 280
Southern Spindle & Flyer Co.263
Southern Welding Co. 281
Southwestern Broom Mfg. Co.268
Spiker & Lose 295
Stafford Co. 5
Staley Mfg. Co., A. E. 258
Standard Fibre Co. 285
Standard Gas Products Co.....274
Stearns, Wm. Taylor 800
Steel Heddle Mfg. Co. 264
Sturtevant Co., B. F. 2
Surpass Chemical Co. 263
Swan & Finch ..... *
Sydnor Pump & Well Co., Inc.281

Taylor Co., Halsey W. 269
Taylor Instrument Co.....289
Terrell Machine Co. 780
Texas Co. 19
Textile Finishing Mchry Co...298
Thompson & Binger, Inc. 271
Tolhurst Machine Works 249
Toomey, Frank, Inc. 282
Transmission Ball Bearing Co..274
Tropical Paint & Oil Co. 293
Truitt Coal & Iron Co. 281
Tufts Co., Arthur 778
Twentieth Century Brass Wks.268

United Chemical Products Co..287
Universal Winding Co. 295
U. S Ball Bearing Co. 16
U. S. Fuel Corp. 291

Vogel Co., Jos. A. 293
Vonnegut Hardware Co. 24

Wadsworth, Howland & Co., Inc. 272
Walke Box Co., Inc. 245
Walraven Co., The 267
Walsh & Weidner Boiler Co..291
Want Ads 282
Warren Soap Mfg. Co. 773
Weimar Bros. 277
Westinghouse Electric & Mfg. Co. ..... *
Westinghouse Lamp Co..... *
White Co. ..... *
Whitinsville Spinning Ring Co.266
Whitin Machine Works 10
Whitin Machine Co., D. E.....287
Wildman Mfg. Co. 792
Williams & Sons, I. B..... *
Wolf & Co., Jacques.....262
Wood's Sons Co., T. B. 17
Woodward Baldwin & Co. 277

Zavon Inc. 259

ARABOL SIZING TALLOW

This is an especially prepared tallow for softening all counts of cotton yarns. We absolutely assure you it will produce any amount of softening desired. In addition to this it will prevent any sticking of yarn to the slasher cylinders and also cause the yarn to open perfectly at the lease. On light pick goods it can be used alone, however we recommend the use of our Gum G in connection with it on goods of 48 picks or more. To be used on either white or colored goods.

Arabol Manufacturing Company

100 William Street, New York City

LOWELL CRAYONS

Meet the requirements of any cotton, woolen or worsted mill.

May we send samples? **15 Colors and White**

Lowell Crayon Company

Original Manufacturers

LOWELL, MASS., U. S. A.

Trade Mark on every box

Carrier Engineering Corporation

750 FRELINGHUYSEN AVE, NEWARK, N. J.

Boston Buffalo Philadelphia Chicago New York

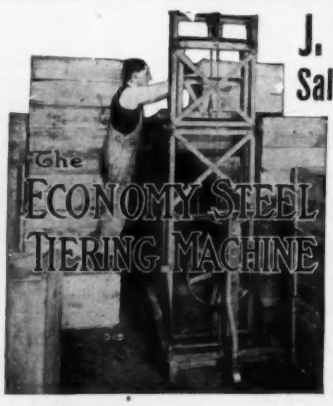
AIR CONDITIONING

(Manufactured Weather)

HUMIDIFICATION CLEANING
WINTER HEATING SUMMER COOLING

We will be glad to tell you why and how nearly two hundred of the finest mills in the U. S. are making "Every day a *good* day" with

CARRIER EQUIPMENT



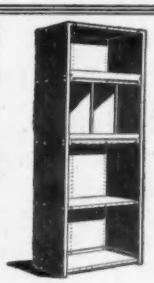
J. D. Collins Sales & Eng'g. Co.

STORAGE AND INDOOR TRANSPORTATION EQUIPMENT

926 Grant Building, Atlanta, Ga.

Equipment that will reduce your storage and handling expenses. Tiering Machines, Electric and Hand Trucks, Overhead Carriers, Gravity and Power Conveyors of al kinds.

Catalogs and full information furnished upon request



Lupton STEEL SHELVING

Tool Stands, Tool Cabinets, Pressed Steel Bench Legs, etc.

Order from Warehouse Stock.

David Lupton's Sons Co.

Amber St. & Allegheny Ave., Philadelphia, Pa.

GEORGE DOWMAN

200 NATIONAL CITY BUILDING,

ATLANTA, GEORGIA

We Are Prepared To Furnish

FIRE DOORS AND WINDOWS OF ALL TYPES
ORNAMENTAL IRON WORK
OVERHEAD CARRIER SYSTEMS
SKYLIGHTS, VENTILATORS
METAL SHINGLES AND CEILING
TOILET PARTITIONS—METAL STAIRS

Contracts Taken for Complete Installations

CORTRIGHT METAL SHINGLES

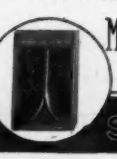
Every shingle was used again—and after 14 years of service

"You will be interested to know that contractors have just finished removing and relaying some shingles placed some 14 years ago—every shingle being used again." Letter from George F. Schrader, Architect, Saranac Lake, N. Y. 6/22/21.

—They were those Cortright Hand Dipped Shingles which we have been telling you about. Made also in Tin, painted Red or Green, Galvanized Tight Coat and Pure Zinc.

Let us send our book

CORTRIGHT METAL ROOFING CO.
Philadelphia *Chicago*



STANDARD SINCE 1887

MAIN OFFICE AND WORKS
PROVIDENCE, R. I.

NEW YORK OFFICE
HUDSON TERMINAL BLDG.

THE TEXTILE-FINISHING MACHINERY CO

CANADIAN REPRESENTATIVES
WHITEHEAD, EMMANS, LTD.
MONTREAL

SOUTHERN REPRESENTATIVE
H. G. MAYER
CHARLOTTE, N. C.

Your Inquiries Solicited for

MACHINERY

of All Kinds and Types for Bleaching, Dyeing, Drying

Mercerizing and Finishing
Piece Goods and Warps

—o—

Our Specialties Are:

Upright and Horizontal Dryers, Warp Mercerizing Machines, Singers, Kiers, Washers, Squeezers, Scutchers, Dye Jiggs, Mangles, Calenders, Tenters, Color and Size Kettles, Warp Dyeing Machinery, Elastic Web and Narrow fabric Finishing Machinery, and Calender Rolls of Cotton Husk, Paper and Patent Combination Stock.

WARP MERCERIZING MACHINE

ADDRESS ENQUIRIES DEPT. P.

PLANS AND ESTIMATES FOR COMPLETE PLANTS AND SPECIAL MACHINERY.

CYCLONE FENCE

Shuts Off the Dangers of Open Premises

Stop the Leaks in Your Property Line

WITH Cyclone Fence, your control of factory premises reaches out like a mighty arm and encircles all territory enclosed.

As easily as you would operate a valve in a steam line, Cyclone Fence enables you to open and close a giant valve in your property line. You regulate, at will, all coming and going—you bar undesirables—you admit only those of your choice.

Cyclone Fence is built of steel throughout. Heavy, chain link fabric is mounted on strong, steel frame work. Posts, set in concrete, are topped with steel extension arms which carry three, 4-point barb wires.

CYCLONE FENCE COMPANY, *General Offices:* Waukegan, Illinois

Factories: WAUKEGAN, ILLINOIS; CLEVELAND, OHIO; FORT WORTH, TEXAS

Branches: Chicago, Rochester, Minneapolis, Philadelphia, Portland, St. Paul, New York, San Francisco, Indianapolis, Baltimore, Los Angeles, Detroit, Kansas City, Buffalo, Oakland

The Complete Line in STANDARD LAMPS

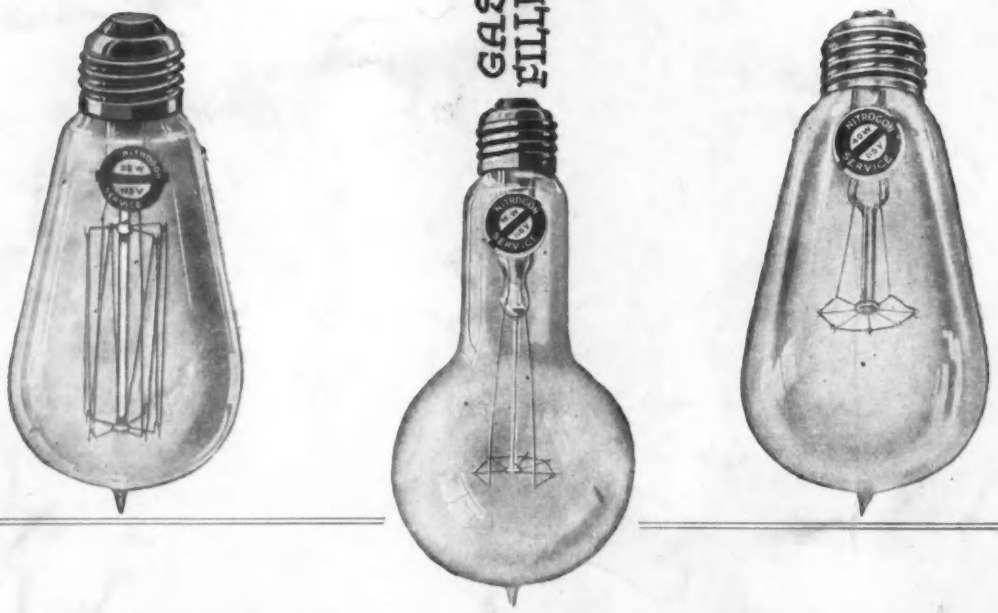
INCANDESCENT

NITROGON SERVICE LAMPS

VACUUM

GAS FILLED

"Nockabout"



The Nockabout Lamps Built for Rough Service

For Mills, Industrial Plants and Shops

Lamps that will withstand vibration when all others fail. They have proven to be the peer of lamps in long lasting service under rough usage. All sizes Write for prices and information. Dealers wanted.

NITROGEN ELECTRIC COMPANY

Factory and General Offices, NEWARK, N. J.

Southern Office and Warehouse:

LUKE SEAWELL, 422 Austell Bldg., Atlanta, Ga.